S6161-ZE-FSE-010

0910-LP-102-8604

TECHNICAL MANUAL

FOR

SERVICE STAND, REFRIGERATED BASE, LOW TEMP, MODELS SRB-45/-48/-57/-78/-84/-93/-94/-100/-119/-136/-145/-157/-168/-NSU; OPERATION, SERVICE, AND INSTALLATION

"Distribution Statement "A": Approved for public release; distribution is unlimited."

DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND

19 JANUARY 2004

0910LP1028604

APPROVAL AND PROCUREMENT RECORD PAGE

APPROVAL DATA FOR: S6161-ZE-FSE-010

TITLE: Technical Manual for Service Stand, Refrigerated Base, Low Temp, Models SRB-45/-48/-57/-78/-84/-93/-94/-100/-119/-136/-145/-157/-168/-NSU; Operation, Service and Installation

APPROVAL AUTHORITY: Not Required

CONTRACT OR PURCHASE ORDER	SHIP APPLICABILITY	QUANTITY OF MANUALS	QUANTITY OF EQUIPMENT	BUILDING YARD
4500092568	CVN69	1	19	Northrop Grumman Newport News

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CERTIFICATION: Not Required DATE: January 19, 2004

Low Temp Industries Inc DBA
Colorpoint
9192 Tara Blvd
Jonesboro, GA 30236-4913
CAGE 09791

OWNER'S OPERATION, SERVICE AND INSTALLATION MANUAL

FOR SERVICE STAND WITH REFRIGERATED BASE

FOR SHIPBOARD USE:

MODEL NUMBERS

SRB-45-NSU, SRB-48-NSU, SRB-57-NSU, SRB-78-NSU, SRB-84-NSU, SRB-93-NSU, SRB-94-NSU, SRB-100-NSU, SRB-119-NSU, SRB-136-NSU, SRB-145-NSU, SRB-157-NSU, SRB-168-NSU

VOLTAGE: 115 VAC
HERTZ: 60
PHASE: 1

LOW TEMP MFG. CO.
9192 TARA BLVD.
JONESBORO, GA 30236

FSCM: 09791

PO # 4500092568

CONTRACTOR: NEWPORT NEWS SHIPBUILDING
4101 WASHINGTON AVENUE
NEWPORT NEWS, VA 23607

APPROVAL AND PROCUREMENT RECORD

APROVAL DATA FOR: SERVICE STAND WITH REFRIGERATED BASE FOR NAVAL SHIPBOARD USE

TITLE OF MANUAL: OWNER'S OPERATION, SERVICE AND INSTALLATION MANUAL FOR SERVICE STAND WITH REFRIGERATED BASE FOR NAVAL SHIPBOARD USE.

APPROVAL AUTHORITY: NAVSSES

CONTRACT NO.	NSN	NO. OF UNITS	MODELS	CID/APL	MANUALS QTY. 2 of 2
		1	SRB-45-NSU		
		2	SRB-48-NSU		
		1	SRB-57-NSU		
		2	SRB-78-NSU		
		1	SRB-84-NSU		
		1	SRB-93-NSU		
		3	SRB-94-NSU		
		2	SRB-100-NSU		
		1	SRB-119-NSU		
		1	SRB-136-NSU		
		1	SRB-145-NSU		
		2	SRB-157-NSU		
		1	SRB-168-NSU		

REMARKS: THIS MANUAL IS BEING SUMITTED UNDER P.O. NO. 4500092568
FROM: NEWPORT NEWS SHIPBUILDING

DATE: _____
CERTIFICATION: _____

IT IS HEREBY CERTIFIED THAT THE MANUALS TO BE PROVIDED UNDER P.O. # 4500092568 FOR NEWPORT NEWS SHIPBUILDING HAVE BEEN APPROVED BY THE APPROVAL DATA SHOWN ABOVE.

SYSTEMS ENGINEER

LOW TEMP MANUFACTURING CO
9192 TARA BOULEVARD
JONESBORO, GEORGIA 30236

IDENTIFYING TECHNICAL PUBLICATION SHEET

MANUFACTURER:	**LOW TEMP MANUFACTURING CO. 9192 TARA BOULEVARD. JONESBORO, GEORGIA 30236**
PURCHASE ORDER:	**450092568**
EQUIPMENT:	**SERVICE STAND, WITH REFRIGERATED BASE FOR SHIPBOARD USE.**
TITLE:	**OWNERS OPERATORS, SERVICE AND INSTALLATION MANUAL**
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SAFETY PRECAUTIONS

WARNING / CAUTION / NOTE USAGE

Warnings and cautions appearing throughout this technical manual are important to personnel and equipment safety. Before any attempt to operate, maintain, troubleshoot, or repair the beverage stand with refrigerated base, all warnings and cautions should be thoroughly reviewed and understood. The following paragraphs define warnings, cautions and notes as they are used in the manual.

WARNING

Identifies and operating or maintenance Procedure, practice, condition, or statement which, if not strictly followed could result in serious injury or death to personnel.

CAUTION

Identifies and operation or maintenance procedure, practice, condition, or statement which, if not strictly followed, could result in destruction of or damage to equipment, or serious impairment of system operation.

NOTE

Highlights an operating or maintenance condition or statement, which is essential but not known to be hazardous in nature as indicated by a warning.

SAFETY SUMMARY

GENERAL SAFETY NOTICES:

The following general safety notices supplement the specific warnings and cautions appearing elsewhere in this manual. They are recommended precautions that must be understood and applied. Should situations arise that are not covered in the general of specific safety precautions, the commanding officer or other authority will issue orders as deemed necessary to cover the situation.

DO NOT REPAIR OR ADJUST ALONE.

Under no circumstances should repair or adjustment of energized equipment be attempted alone. The immediate presence of someone capable of rendering aid is required. Before making adjustments, be sure to protect against grounding. If possible, adjustments should be made with one hand, with the other hand free and clear of equipment. Even when power has been removed from equipment circuits, dangerous potentials must be grounded and all capacitors discharged prior to attempting repairs.

TEST EQUIPMENT

Make certain test equipment is in good condition. If a test meter must be held, ground the case of the meter before starting measurements; do not touch live equipment or personnel working on live equipment while holding a test meter. Some types of measuring devices should not be grounded; these devices should not be held when taking measurements.

INTERLOCKS.

Interlocks are provided for safety of personnel and equipment and should be used only for the purpose intended. They should not be battle shorted or otherwise modified except by authorized maintenance personnel. Do not depend solely upon interlocks for protection. Whenever possible, disconnect power at power distribution source.

INSTALLATION INSTRUCTIONS

WARNING

AFTER UNCRATING THE STAND, LOCATE THE UNIT IN IT'S FINAL POSITION AND FASTEN THE LEGS TO THE DECK OF THE SHIP.

WAIT 24 HOURS AFTER INSTALLATION BEFORE ATTEMPTING TO START THE COMPRESSOR. THIS ALLOWS ALL OF THE OIL INSIDE OF THE COMPRESSOR TO SETTLE INTO IT'S REQUIRED POSITION. FAILURE TO WAIT BEFORE ATTEMPTING TO START MAY RESULT IN COMPRESSOR DAMAGE OR FAILURE.

START UP:

*****CAUTION*****

WAIT 24 HOURS AFTER INSTALLATION BEFORE ATTEMPTING TO START THE COMPRESSOR. FAILURE TO WAIT BEFORE ATTEMPTING TO START MAY RESULT IN COMPRESSOR DAMAGE OR FAILURE.

THE REFRIGERATION SYSTEM SUPPLIED WITH THE REFRIGERATOR IS OF THE HERMETIC TYPE. AN EXPANSION VALVE METERS REFRIGERANT. EACH REFRIGERATOR IS SELF-CONTAINED AND HAS BEEN LEAK TESTED, CHARGED WITH REFRIGERANT AND OPERATED TO ENSURE THE PROPER OPERATION AND SETTING OF CONTROLS. AFTER INSTALLING THE REFRIGERATOR AS DESCRIBED IN THE INSTALLATION SECTION, ENERGIZE THE UNIT BY ATTACHING THE PLUG TO AN APPROPRIATE ELECTRICAL SUPPLY (115VAC, 60HZ, SINGLE PHASE) AND TURNING ON THE SERVICE SWITCH LOCATED IN THE COMPRESSOR COMPARTMENT. AFTER APPROXIMATELY THIRTY MINUTES OF OPERATION THE UNIT WILL BE READY TO USE.

OPERATION:

THE TEMPERATURE IN THE REFRIGERATOR COMPARTMENT OF THE SRB-NSU IS REGULATED BY THE DUAL PRESSURE CONTROL (PHYSICALLY LOCATED IN THE FRONT OF THE COMPRESSOR COMPARTMENT) IS ADJUSTED BY TURNING THE KNOBS ON THE TOP OF IT WITH A SCREW DRIVER. THE CUT- IN IS SET AT THE FACTORY AT +40 PSI AND THE DIFFERENTIAL IS SET AT 15. RAISING THE CUT- IN WILL CAUSE THE REFRIGERATOR COMPARTMENT TEMPERATURE TO BE HIGHER AND LOWERING THE CUT- IN WILL CAUSE THE TEMPERATURE TO BE LOWER. LOWERING THE CUT- IN TOO LOW WILL CAUSE THE COMPRESSOR TO RUN CONTINUOUSLY, WHICH WILL SHORTEN THE EXPECTED LIFE OF THE COMPRESSOR. THE DIFFERENTIAL SHOULD NOT BE SET LOWER THAN 10, AS THIS WILL CAUSE THE COMPRESSOR TO SHORT CYCLE, WHICH CAN LEAD TO PREMATURE COMPRESSOR FAILURE. CONDENSATION FROM THE REFRIGERATOR COILS IN THE WALLS FREEZES AS FROST OR ICE ON THE WALLS OF THE REFRIGERATOR COMPARTMENT. IF THE UNIT IS CONTINUOUSLY OPERATED FOR SEVERAL WEEKS IN CONDITIONS OF HIGH HUMIDITY AND THE DOOR IS LEFT OPEN OR OPENED FREQUENTLY, THE FROST MAY THICKEN TO A POINT AT WHICH IT WILL PREVENT PROPER HEAT TRANSFER FROM THE COILS TO THE COMPARTMENT AIR. IF THIS OCCURS, THE COMPRESSOR WILL RUN FOR ONLY A FEW SECONDS AND SHUT OFF AND IT WILL BE NECESSARY TO DEFROST THE REFRIGERATOR COMPARTMENT TO RESTORE PROPER OPERATION.

MAINTAINING AND CLEANING THE CABINET:

SERVICE STANDS ARE CONSTRUCTED OF 304 STAINLESS STEEL, THUS WATER OR MILD DETERGENT AND A DAMPENED CLOTH ARE ALL THAT ARE NEEDED TO CLEAN THE CABINET SURFACES. FOOD PARTICLES CONTAIN MANY ACIDS AND ARE QUITE HARMFUL IN A CORROSIVE ACTION TO MANY MATERIALS. THESE FOOD PARTICLES MUST BE WIPED UP AND THE REFRIGERATOR KEPT CLEAN. AFTER USAGE OR SHUT DOWN, WATER CONDENSATION MUST BE WIPED DRY AND NOT ALLOWED TO AIR DRY AS THIS, IN TIME, WILL CAUSE HARD TO REMOVE WATER STAINS.

******CAUTION******

DO NOT USE HARSH CHEMICALS, ACIDS OR ALKALIS IN THE CLEANING OF THE REFRIGERATOR OR ITS INSERTS.

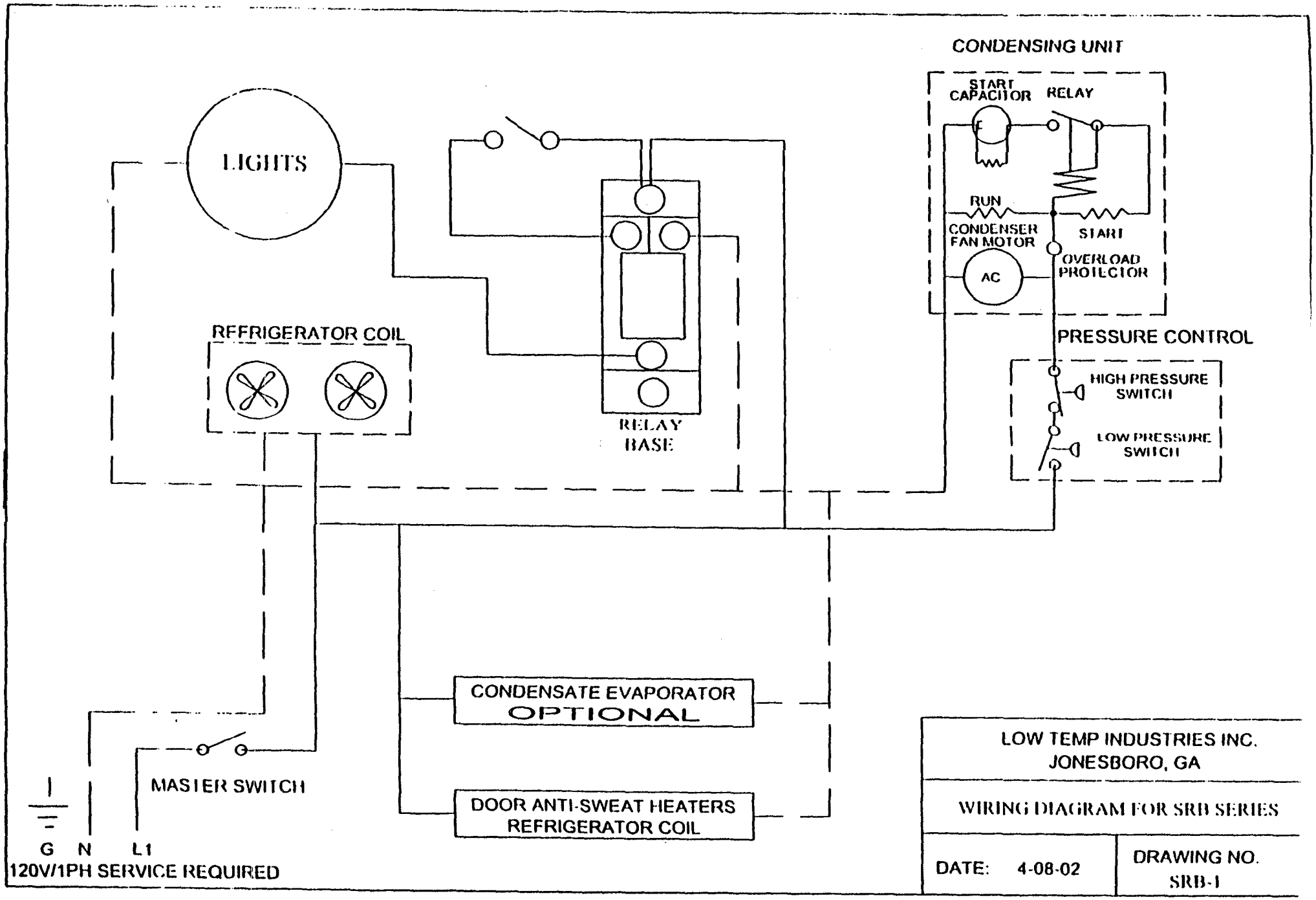
ELECTRICAL SYSTEM:

******WARNING******

IN ORDER TO PREVENT ANY ELECTRICAL ACCIDENTS, THIS REFRIGERATOR SHOULD BE INSTALLED AND SERVICED ONLY BY QUALIFIED MAINTENANCE PERSONNEL PER NATIONAL ELECTRICAL CODE STANDARDS.

******WARNING******

INDIVIDUAL BREAKERS OR FUSES SHOULD BE PROVIDED FOR EACH COMPRESSOR MOTOR. GROUP FUSING, WHERE TWO OR MORE COMPRESSORS ARE INSTALLED ON ONE FUSE OR BREAKER IS NOT RECOMMENDED. REFER TO THE NATIONAL ELECTRICAL CODE FOR APPROPRIATE LINE FUSE OR BREAKER SIZE.


CONDENSING UNIT
START CAPACITOR
RELAY
RUN
CONDENSER FAN MOTOR
START
OVERLOAD PROTECTOR
AC
LIGHTS
REFRIGERATOR COIL
RELAY BASE
PRESSURE CONTROL
HIGH PRESSURE SWITCH
LOW PRESSURE SWITCH
CONDENSATE EVAPORATOR
OPTIONAL
DOOR ANTI-SWEAT HEATERS
REFRIGERATOR COIL
MASTER SWITCH
G N L1
120V/1PH SERVICE REQUIRED
LOW TEMP INDUSTRIES INC.
JONESBORO, GA
WIRING DIAGRAM FOR SRB SERIES
DATE: 4-08-02
DRAWING NO.
SRB-1

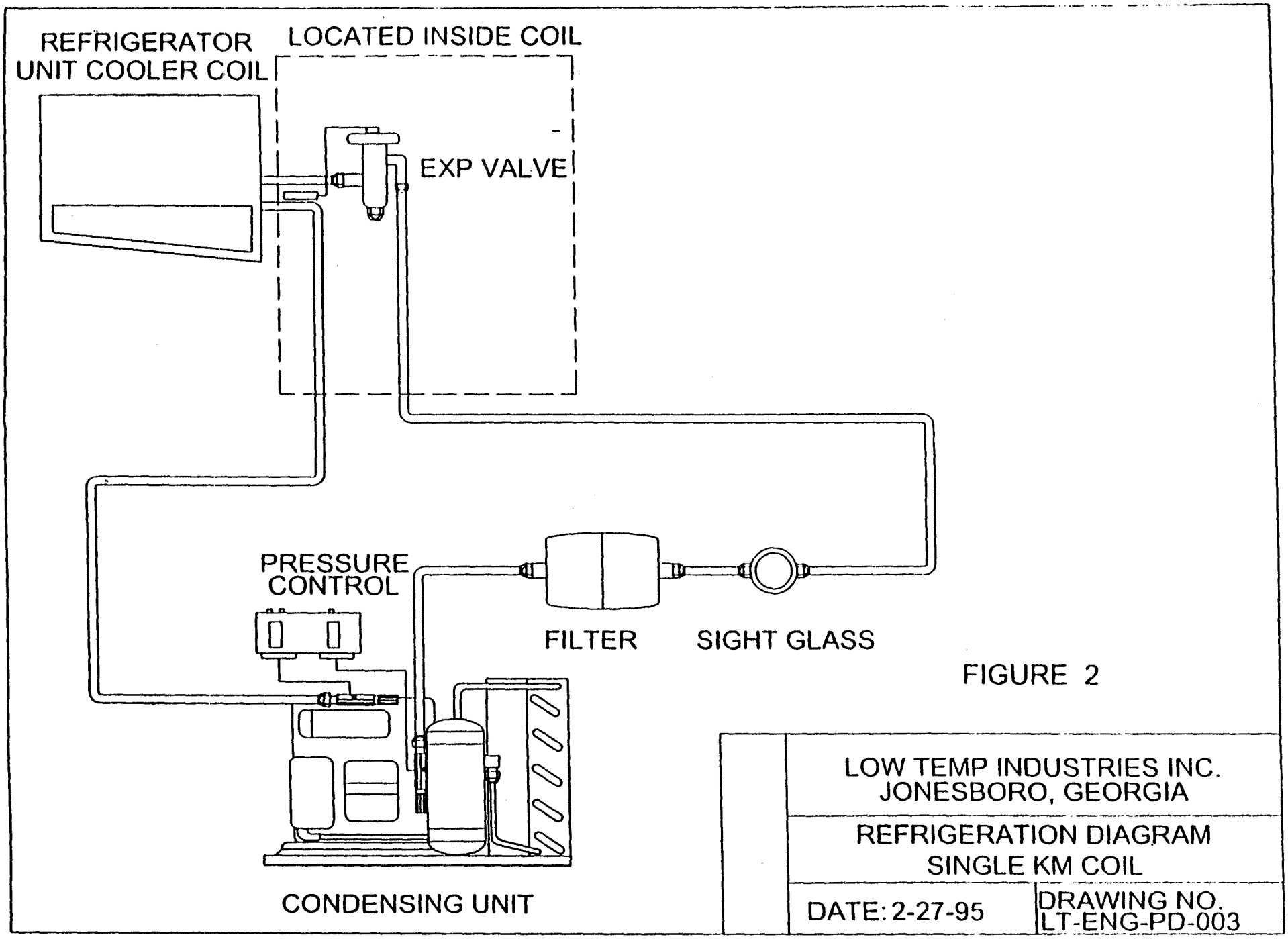


FIGURE 2

	LOW TEMP INDUSTRIES INC. JONESBORO, GEORGIA
	REFRIGERATION DIAGRAM SINGLE KM COIL
DATE: 2-27-95	DRAWING NO. LT-ENG-PD-003

BASIC SYSTEM OPERATION
(REFRIGERATION SYSTEM)

THIS UNIT USES 134A REFRIGERANT WHICH IS OZONE FRIENDLY

THE FOLLOWING SECTION IS DESIGNED TO GIVE A BASIC WORKING KNOWLEDGE OF OUR SYSTEM. IT SHOULD NOT BE USED AS A TRAINING MANUAL FOR NON- QUALIFIED REFRIGERATION TECHNICIANS.

ALL REFRIGERATED EQUIPMENT EMPLOYS A COMPRESSION CYCLE SYSTEM. THERE ARE TWO PRESSURES, WHICH EXIST IN A COMPRESSION SYSTEM: THE EVAPORATING OR LOW PRESSURE, AND THE CONDENSING OR HIGH PRESSURE.

THE REFRIGERANT WORKS AS A TRANSPORTATION MEDIUM TO MOVE HEAT FROM THE EVAPORATOR TO THE CONDENSER WHERE IT IS GIVEN OFF TO THE AMBIENT AIR. THE CHANGE OF STATE FROM LIQUID TO VAPOR AND BACK ALLOWS THE REFRIGERANT TO ABSORB AND DISCHARGE LARGE QUANTITIES OF HEAT EFFICIENTLY.

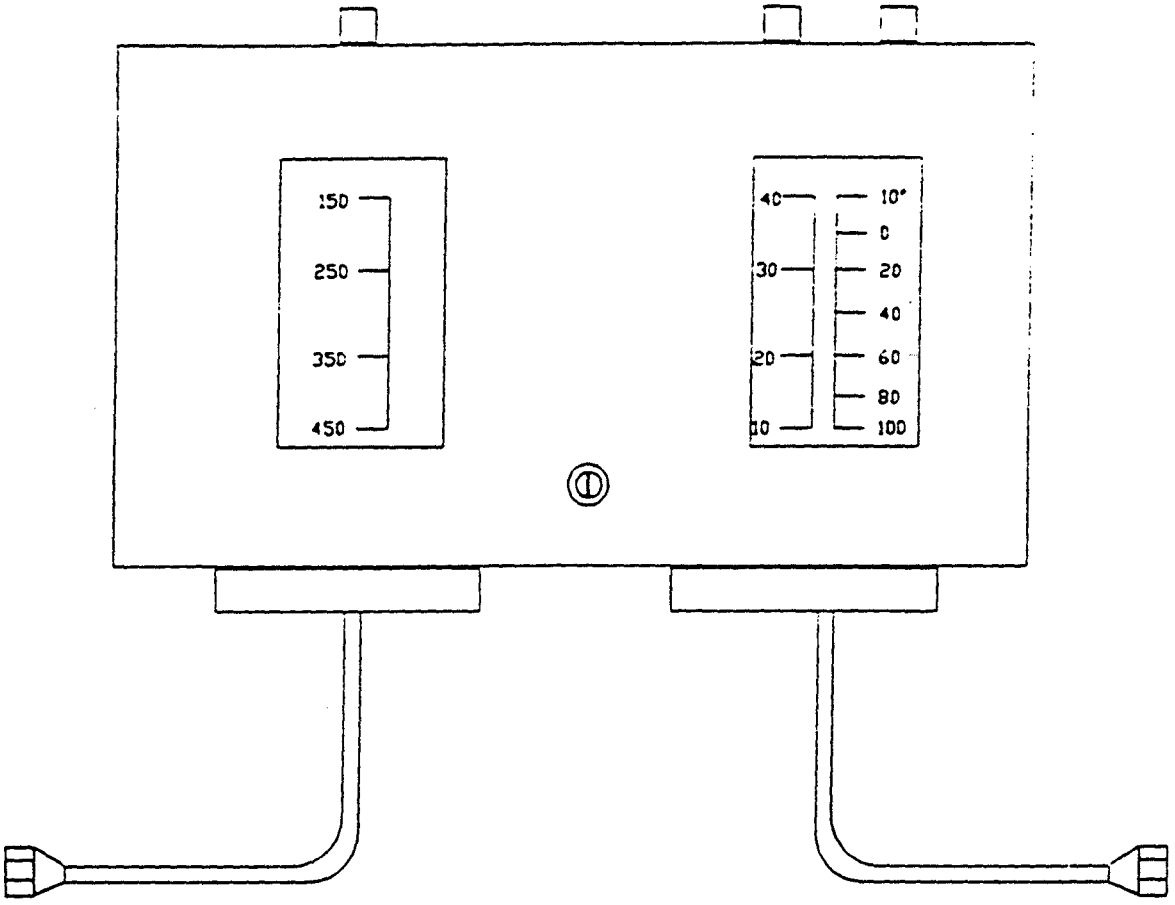
THE BASIC SYSTEM OPERATES AS FOLLOWS:

HIGH-PRESSURE LIQUID REFRIGERANT IS FED FROM THE RECEIVER THROUGH THE LIQUID LINE ,THROUGH THE FILTER DRIER AND SIGHT GLASS TO THE EXPANSION VALVE, WHICH WORKS AS A METERING DEVICE SEPARATING THE HIGH-PRESSURE SIDE OF THE SYSTEM FROM THE LOW-PRESSURE EVAPORATOR.

THE THERMOSTATIC EXPANSION VALVE CONTROLS THE FEED OF LIQUID REFRIGERANT TO THE EVAPORATOR, AND BY MEANS OF AN ORFICE REDUCES THE PRESSURE OF THE REFRIGERANT TO THE EVAPORATING OR LOW-PRESSURE SIDE.

THE REDUCTION OF PRESSURE ON THE LIQUID REFRIGERANT CAUSES IT TO BOIL OR VAPORIZE UNTIL THE REFRIGERANT IS AT THE SATURATED TEMPERATURE CORRESPONDING TO ITS PRESSURE. AS THE LOW-TEMPERATURE REFRIGERANT PASSES THROUGH THE EVAPORATOR COIL, HEAT FLOWS THROUGH THE WALLS OF THE EVAPORATOR TUBING TO THE REFIGERANT, CAUSING THE BOILING ACTION TO CONTINUE UNTIL THE REFRIGERANT IS COMPLETELY VAPORIZED.

FIGURE 3



RANCO MODEL 012-4834-000 DUAL PRESSURE CONTROL

NUMBER OF POLES:	1
CONTACT ACTION:	
(CONTROL LOW PRESS. SIDE)	OPEN ON LOW, CLOSE ON HIGH
(SAFETY HIGH PRESS. SIDE)	CLOSE ON HIGH, OPEN ON LOW
LOW PRESSURE SIDE	
CUT-IN SETTING RANGE:	10" MERCURY VAC TO 100 PSI
DIFFERENTIAL:	10 TO 40 PSI
HIGH PRESSURE SIDE	
CUT-OUT RANGE:	150 TO 450 PSI
DIFFERENTIAL:	70 PSI
AC FULL LOAD AMPS	24
REFRIGERANT CONNECTIONS:	1/4" FEMALE FLARE, 36" CAPILARY

COPELAND CONDENSING UNIT M2FH-0040-IAA-212 SPECIFICATIONS:

NOMINAL HORSEPOWER:	1/3
ELECTRICAL:	115VAC, 60 HZ, 1 PHASE, 10.5 AMP
BTU/HR:	3480 @ 35 DEG, 3150 @ 30 DEG. 2840 @ 25 DEG, 2530 @ 20 DEG.
LIQUID LINE FITTING:	1/4" MALE FLARE
SUCTION LINE FITTING:	3/8" MALE FLARE
RECEIVER PUMP DOWN CAPACITY:	2.0 POUNDS
OIL CHARGE: OZ.	INITIAL 20 FLUID OZ, RECHARGE 14 FLUID
SHIPPING WEIGHT:	46 LBS.

CONDENSING UNIT PARTS LIST FOR SRB-SERIES-NSU REFRIGERATED SERVICE STAND:

PARTS LIST ITEM NO.	PART NAME	COPELAND PART NO.
1	CONDENSING UNIT	M2FH-0040-IAA-212
2	START CAPACITOR	014-0038-04
3	START RELAY	040-C411-83
4	OVERLOAD PROTECTOR	071-0554-25
5	COMPRESSOR	ARE41C3-IAA
6	CONDENSER FAN MOTOR	083-0142-00
7	CONDENSER FAN BLADE	050-0259-00

COPELAND CONDENSING UNIT FTAF-0056-IAA-201 SPECIFICATIONS:

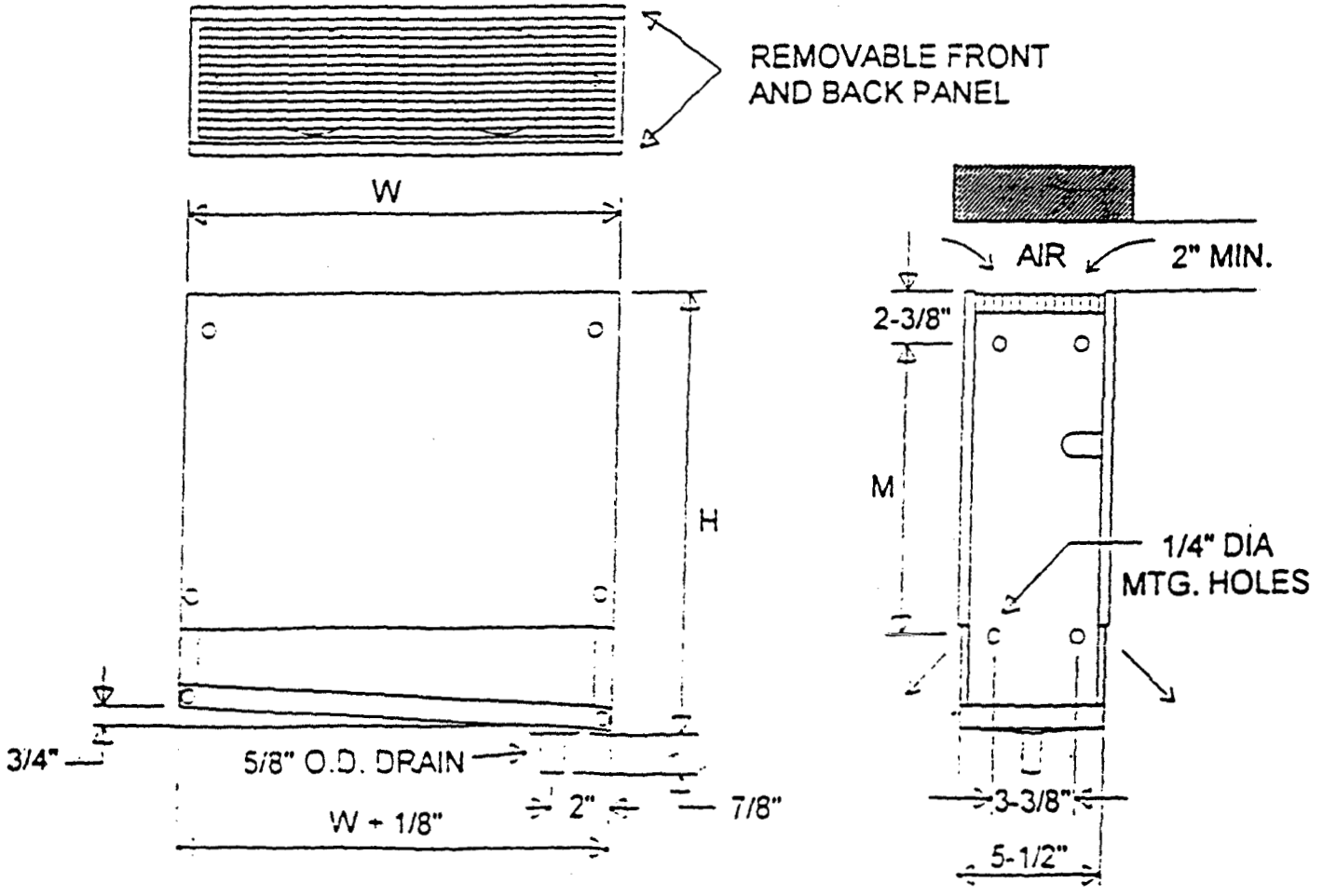
NOMINAL HORSEPOWER:	1/2
ELECTRICAL:	115VAC, 60 HZ, 1 PHASE, 21.5 AMP
BTU/HR:	5510 @ 25 DEG, 5000 @ 20 DEG.
LIQUID LINE FITTING:	1/4" MALE FLARE
SUCTION LINE FITTING:	5/8" MALE FLARE
RECEIVER PUMP DOWN CAPACITY:	2.0 POUNDS
OIL CHARGE:	INITIAL 20 FLUID OZ, RECHARGE 14 FLUID OZ.
SHIPPING WEIGHT:	46 LBS.

CONDENSING UNIT PARTS LIST FOR SRB-SERIES-NSU REFRIGERATED SERVICE STAND:

PARTS LIST ITEM NO.	PART NAME	COPELAND PART NO.
1	CONDENSING UNIT	FTAF-0056-IAA-201
2	START CAPACITOR	014-0008-79
3	START RELAY	040-0088-04
4	OVERLOAD PROTECTOR	071-0127-06
5	COMPRESSOR	RF18C1E-IAA
6	CONDENSER FAN MOTOR	050-0267-00
7	CONDENSER FAN BLADE	083-0133-00

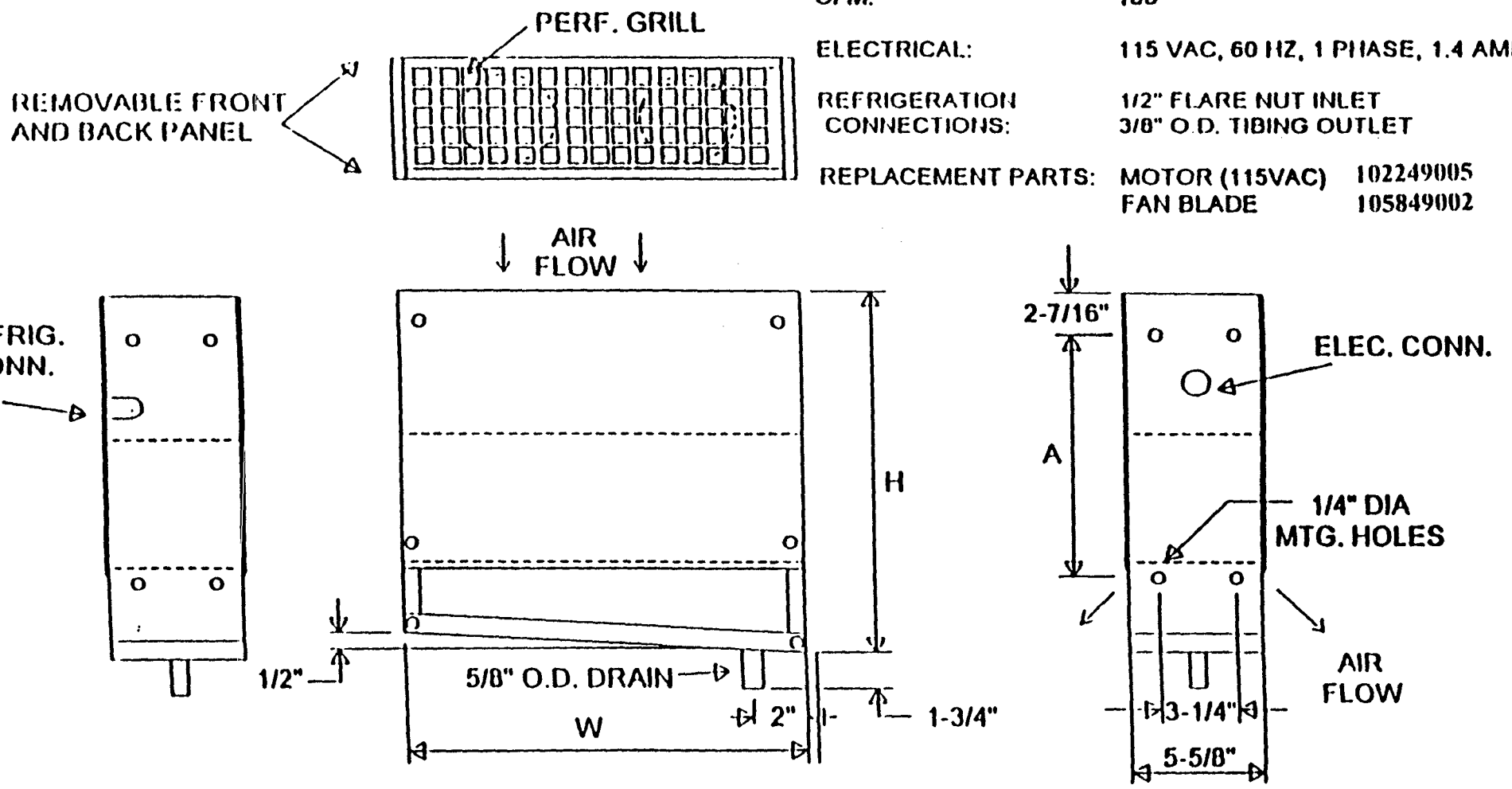
BOHN KM-0130 AND KM-0170 UNIT COOLERS
FIGURE 4

	KM-0130	KM-0170
PHYSICAL DIMERSIONS:	H = 17-3/4" W = 15-5/8" M = 12-1/4"	H = 19-3/4" W = 15-5/8" M = 14-1/4"
SHIPPING WEIGHT:	19 LBS	20 LBS
BTU/HR:	1250 @ 10 DEGREES TD	1650 @ 10 DEGREES TD
CFM:	180	200
ELECTRICAL: (BOTH)	115 VAC, 60 HZ, 1 PHASE, 1.4 AMP	
REFRIGERATION CONNECTIONS: (BOTH)	1/2" FLARE NUT INLET 3/8" O.D. TIBING OUTLET	
REPLACEMENT PARTS: (BOTH)	MOTOR (115VAC) 5021S MOTOR MOUNT 91179001 FAN BLADE 5102C GUARD 5076E HARNESS 4358L001	



RUSSEL MODEL MDF-27-13-RP UNIT COOLER
FIGURE 5

PHYSICAL DIMERSIONS:	H = 17-1/8" W = 15-3/8" M = 12-1/4"
SHIPPING WEIGHT:	16 LBS
BTU/HR:	1250 @ 10 DEGREES TD
CFM:	180
ELECTRICAL:	115 VAC, 60 HZ, 1 PHASE, 1.4 AMPS
REFRIGERATION CONNECTIONS:	1/2" FLARE NUT INLET 3/8" O.D. TIBING OUTLET
REPLACEMENT PARTS:	MOTOR (115VAC) 102249005 FAN BLADE 105849002



(11)

HEATCRAFT™ Inc.

REFRIGERATION PRODUCTS DIVISION

H-IM-55A | October 1993 | Part No.90800106

Replaces H-IM-55 5/93

Thin Profile Air Defrost Unit Cooler Installation & Maintenance Data

NOMENCLATURE

XX (K) 17 B F

XX = Thin Profile Air Defrost

K = Coated Coil (Optional)

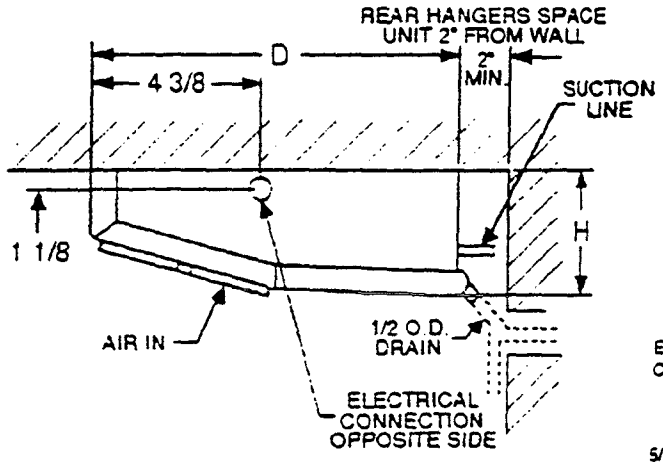
Size

17 — Vintage

A = 115-1-60
B = 208/230-1-60

FOR FOOD SERVICE INSTALLATIONS seal any joint between unit cooler and cooler liner with a sealant listed by the National Sanitation Foundation, Standard 51

FIG. 1. Dimensional Diagram



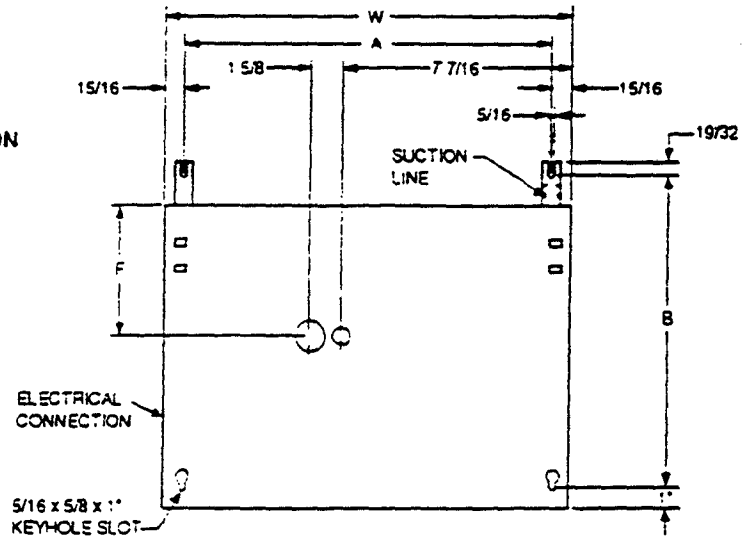


TABLE 1. Dimensional Data

Size	DIMENSIONS A	B	H	W	D	F	CONNECTIONS Coil Inlet	Suction	Drain	Approx. Ship. Wt.
10	14 5/8	14	4 1/2	16 1/2	13 1/2	5 1/4	1/2 FN	3/8 ID	1/2 OD	14
13	18 5/8	14	4 1/2	20 1/2	13 1/2	5 1/4	1/2 FN	3/8 ID	1/2 OD	17
17	22 1/8	15	4 1/2	24	14 1/2	6 1/4	1/2 FN	1/2 ID	1/2 OD	21
23	29 3/4	15	4 1/2	31 5/8	14 1/2	6 1/4	1/2 FN	1/2 ID	1/2 OD	28
30	38 1/8	15	4 1/2	40	14 1/2	6 1/4	1/2 FN	1/2 ID	1/2 OD	33
43	51 1/2	15	4 1/2	53 5/8	14 1/2	6 1/4	1/2 FN	5/8 ID	1/2 OD	44
55	51 1/2	15	6 1/2	53 5/8	14 1/2	6 1/4	1/2 FN	5/8 ID	1/2 OD	53

Inspection

When the equipment is received, all items should be carefully checked against the bill of lading to make sure all crates and cartons have been received. All units should be carefully inspected for hidden damage when received. If any damage is found, it should be reported to the carrier immediately and a claim should be filed. The unit nameplate should be checked to make sure that the voltage agrees with the power supply available.

Installation

NOTE: **Installation and maintenance are to be performed only be qualified personnel who are familiar with local codes and regulations, and experienced with this type of equipment.**

CAUTION: **Sharp edges and coil surfaces are a potential injury hazard. Avoid contact with them.**

Mounting

The thin profile air defrost unit cooler is designed for mounting from the top of the cooler. Drill holes for screws in accordance with mounting dimensions A and B of Table 1.

After unpacking the unit, remove the fan panel and arrange the rear brackets as shown in the drawing. Insert the screws for mounting the rear brackets into the top of the cooler cabinet. Slip the rear brackets, attached to the unit, between the screw head and cabinet and secure in place. Install the front mounting screws. For proper drainage, the unit should be installed level.

Drain Line

After installing the fan panel assembly, connect the drain line to the fitting provided on the unit. A plastic hose or metal drain line can be used. If a metal drain line is used, expand the connection end to 1/2" I.D. and force over the drain fitting.

The drain line should be trapped, preferably on outside of box. All condensate water must be disposed of properly and sould not be allowed to accumulate or cause a safety hazard.

Wiring

The nameplate on the unit is marked with the current characteristics to be used for wiring the unit. The unit must be grounded. All wiring should be done in accordance with applicable national and local codes.

Expansion Valve

Install expansion valve and feeler bulb inside cabinet of the unit. Recommended valve sizes are given in Table 2.

Table 2. Expansion Valve Recommendations

Model	+25°F. SUCTION 10° TD					+20°F. SUCTION 15° TD				
	BTUH	ALCO		SPORLAN		BTUH	ALCO		SPORLAN	
Size	10° TD	R-12	R-22	R-12	R-22	15° TD	R-12	R-22	R-12	R-22
10	1000	HF1/4FC	HF1/4HC	FF1/4FC	FV1/4VC	1500	HF1/4FC	HF1/4HC	FF1/4FC	FV1/4VC
13	1300					1950				
17	1700					2550				
23	2300					3450	HF1/2FC	HF1/2HC	FF1/2FC	FV1/2VC
30	3000					4500				
*43	4300	HFE1/2FC	HFE1/2HC	FFE1/2FC	FVE1/2VC	6450	HFE1FC	HFE1HC	FFE1FC	FVE1VC
*55	5500					8250				

**Sizes 43 and 55 use external equalized valves.*

Motors

Motors are lifetime lubricated and thermally protected. Check an inoperative motor by disconnecting and applying correct voltage across leads. If test fails, replace the motor

Units with electrical code "A" are suitable for 115/60/1 or 110/50/1 and code "B" models are suitable for 208-230/60/1 or 220/50/1 Code approvals do not apply to 50 Hz. operation

Before starting the unit, rotate fan blades to make sure they turn freely and have sufficient clearance.

Maintenance

It is recommended that the unit be inspected occasionally for dirt accumulation. Grease and soil should be removed from the fan, fan guard and drain pan

Replacement Parts

Table 3 gives the part numbers of the common replacement parts When ordering parts, always give the complete model number and serial number of the unit

TABLE 3. Replacement Parts

Description	All Sizes Part Number
115V Motor	25300701
208/230 Motor	25300801
Fan Blade	51018
Fan Guard	50540
Motor Mount	91179001

Since product improvement is a continuing effort at Heatcraft, we reserve the right to make changes in specifications without notice

HEATCRAFT Inc.
REFRIGERATION PRODUCTS DIVISION
P O Box 1699, Atlanta, GA 30371 • (404) 939-1450 • FAX. (404) 723-0203

SPORLAN SEE-ALL MOISTURE AND LIQUID INDICATOR SA-12S

OVERALL LENGTH:	2.56
INLET FITTING:	1/4" FEMALE SWEAT
OUTLET FITTING:	1/4" FEMALE SWEAT

FOR R-134A REFRIGERANT LIQUID LINE TEMPERATURE MOISTURE IN PPM

COLOR	75 DEG.	100 DEG.	125 DEG.
GREEN	BELOW 5	BELOW 10	BELOW 20
CHARTREUSE	5-15	10-30	20-50
YELLOW	ABOVE 15	ABOVE 30	ABOVE 50

IT IS RECOMMENDED THAT THE REFRIGERATOR OPERATE FOR ABOUT 12 HOURS TO ALLOW THE MOISTURE IN THE SYSTEM AND THE SEE-ALL COLOR TO COME TO COMPLETE EQUILIBRIUM. THE ACTION OF THE INDICATOR ELEMENT IS COMPLETELY REVERSIBLE AND WILL CHANGE COLOR AS OFTEN AS THE MOISTURE CONTENT OF THE SYSTEM VARIES. THE DRYING OF THE SYSTEM SHOULD BE CONTINUED UNTIL THE INDICATOR ELEMENT CHANGES FROM CHARTREUSE TO GREEN. THE ACTUAL MOISURE CONTENT OF THE REFRIGERANT WILL BE IN ACCORDANCE WITH THE ABOVE TABLE.

TO REPLACE THE SEE-ALL SEE THE FILTER DRIER REPLACEMENT INSTRUCTIONS ON PAGE 27.

SPORLAN TYPE SQ-O (1/6T) JC-5' EXPANSION VALVE

CAPACITY:	1/6 TON
INLET CONNECTION:	3/8" FEMALE SWEAT
OUTLET CONNECTION:	1/ " FEMALE SWEAT
BULB SIZE:	.50" OD x 3.0" LONG
TYPE CHARGE:	C

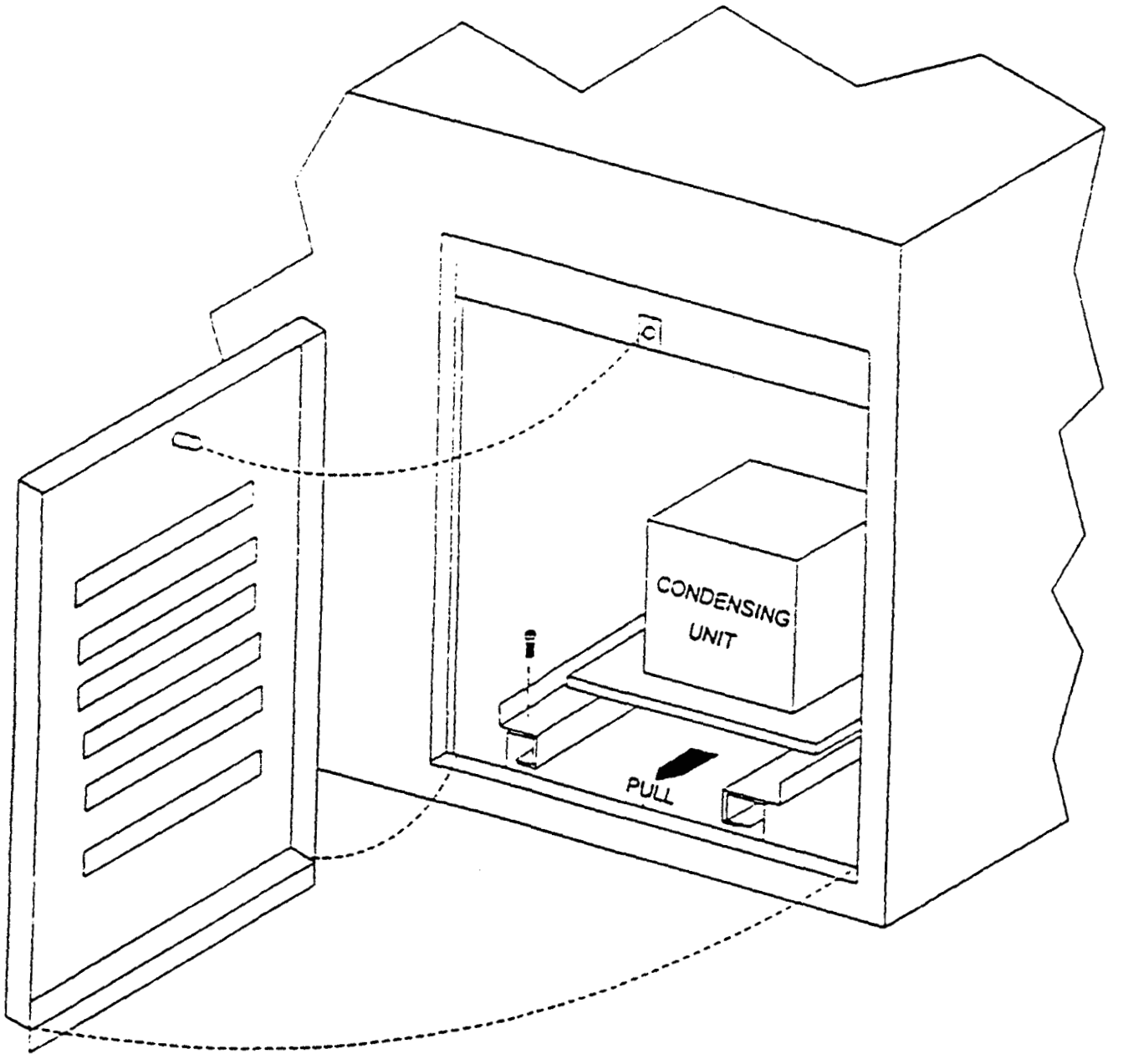
*******CAUTION*******

THE EXPANSION VALVE IN EACH REFRIGERATION SYSTEM HAS BEEN CAREFULLY ADJUSTED AT THE FACTORY FOR PROPER REFRIGERATION OPERATION AND LONG COMPRESSOR LIFE. UNDER ALL NORMAL CONDITIONS IT WILL NOT BE NECESSARY TO ADJUST THE VALVE AT ALL. DIFFERENT TEMPERATURES IN THE REFRIGERATION COMPARTMENT CAN BE OBTAINED BY ADJUSTING THE RANCO DUAL PRESSURE CONTROL WHILE LEAVING THE EXPANSION VALVE UNTOUCHED.

******WARNING******

IMPROPER ADJUSTMENT TO THE EXPANSION VALVE MAY RESULT IN COMPRESSOR DAMAGE.

CONDENSING UNIT ACCESS
FIGURE 6



1. TO REMOVE THE LOUVERED PANEL LOOSEN THE THUMBSCREW LOCATED AT THE TOP OF THE PANEL.

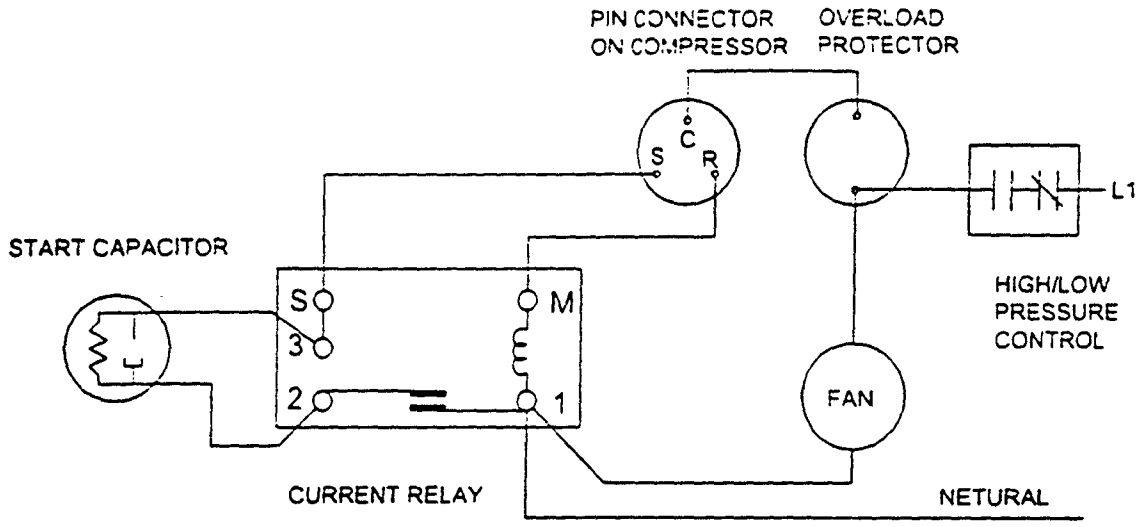
2. TILT THE TOP OUT AND LIFT THE PANEL STRAIGHT UP.

*****CAUTION*****

ONLY PULL UNIT OUT FAR ENOUGH AS NEEDED FOR CLEANING OR SERVICING.
DO NOT PULL ALL THE WAY OUT.

3. REMOVE THE SHEET METAL SCREW FROM THE SLIDE RAIL AND PULL CONDENSING UNIT STRAIGHT OUT.

CONDENSING UNIT WIRING DIAGRAM
FIGURE 7



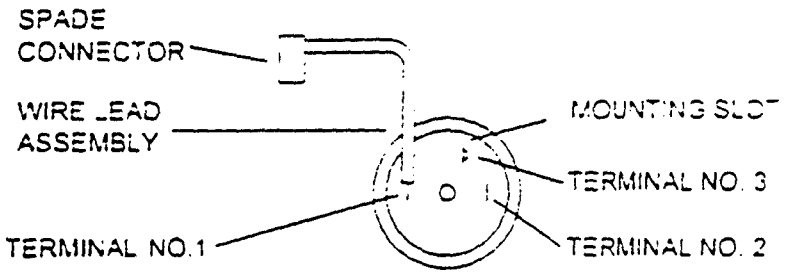
NOTE! THIS DIAGRAM REFLECTS ONLY THE CONDENSING UNIT AND NO OTHER ELECTRICAL COMPONENTS SUCH AS BLOWER COILS AND CONDENSATE HEATERS. THIS SECTION IS SPECIFICALLY FOR TROUBLE SHOOTING THE CONDENSING UNIT.

A. USING A VOLT METER CHECK THE POWER SUPPLY
B. USING AN OHM METER DISCONNECT THE POWER FROM THE UNIT AND CHECK THE CONTINUITY OF THE SYSTEM. DISCONNECT THE FAN MOTOR FROM THE CIRCUIT BEFORE BEGINNING.

NOTE! IF ALL OF THE FOLLOWING TESTS PROVE SATISFACTORY AND THERE ARE NOT RESTRICTIONS IN THE SYSTEM, BUT THE SYSTEM STILL FAILS TO OPERATE PROPERLY, REPLACE THE RELAY. THE NEW RELAY WILL ENSURE THAT NO FAULTY ELECTRICAL CHARACTERISTICS EXIST THAT THE ABOVE TEST WOULD NOT DETECT. IF THIS DOES NOT CORRECT THE PROBLEM THE COMPRESSOR SHOULD BE CONSIDERED DEFECTIVE AND REPLACED.

1. ACROSS CONTROL - NO CONTINUITY - CLOSE CONTROL CONTACTS - STILL NO CONTINUITY - REPLACE CONTROL
2. CONTROL CONNECTION AT PROTECTOR AND C - NO CONTINUITY - PROTECTOR MAY BE TRIPPED - WAIT 10 MINUTES - TRY AGAIN - IF NO CONTINUITY PROTECTOR IS DEFECTIVE - REPLACE PROTECTOR.
3 REMOVE COMPRESSOR RELAY FROM HOUSING - CHECK ACROSS TERMINALS 1 AND M - NO CONTINUITY - REPLACE RELAY.
4. CHECK ACROSS COMPRESSOR TERMINALS C AND R - NO CONTINUITY - OPEN RUN WINDING - REPLACE COMPRESSOR
5. CHECK ACROSS COMPRESSOR TERMINALS C AND S - NO CONTINUITY - OPEN START WINDING - REPLACE COMPRESSOR.
6 CHECK ACROSS COMPRESSOR TERMINAL C AND SHELL OF COMPRESSOR - CONTINUITY - GROUNDED MOTOR REPLACE COMPRESSOR

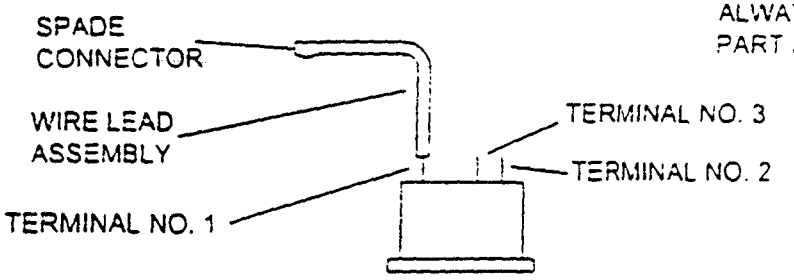
COMPRESSOR MOTOR OVERLOAD
FIGURE NO. 8



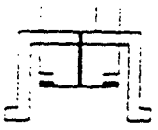
TOP VIEW

THIS CONDENSING UNIT IS PROVIDED WITH A SURFACE MOUNTED TEMPERATURE/CURRENT SENSING PROTECTOR. THIS UNIT EMPLOYS A BI-METAL ELEMENT WHICH WILL REACT TO BOTH TEMPERATURE RISE AND EXCESSIVE CURRENT DRAW.

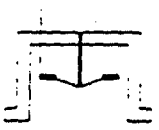
ALWAYS REPLACE THIS UNIT WITH THE EXACT PART SPECIFIED IN THE PARTS LIST



SIDE VIEW



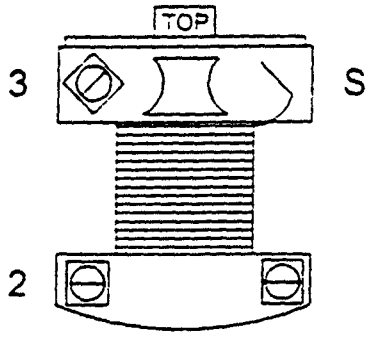
OPEN

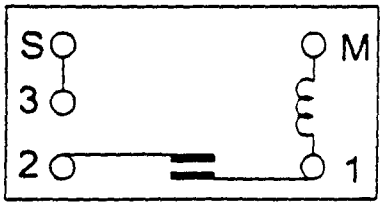


CLOSED

THE OVERLOAD PROTECTOR IS LOCATED INSIDE THE ELECTRICAL WIRING BOX TO REMOVE THE UNIT, SQUEEZE THE HOLDING SPRING IN TO RELEASE IT FROM THE HOLDING TABS. THE OVERLOAD WILL LIFT OUT OF THE UNIT WITH THIS WIRE REMOVED.

COMPRESSOR MOTOR STARTING RELAY
FIGURE 9



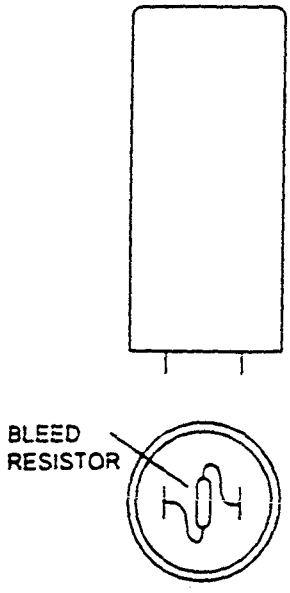


THE COMPRESSOR MOTOR STARTING RELAY IS A SWITCHING DEVICE USED TO REMOVE THE START WINDINGS AND THE MOTOR STARTING CAPACITOR FROM THE CIRCUIT AFTER THE MOTOR CURRENT HAS APPROCHED NORMAL FULL LOAD CONDITIONS.

THIS UNIT EMPLOYS A CURRNET RELAY WHICH IS NORMALLY OPEN WHEN DEENERGISED, AND THE COIL IS WOUND SO THAT THE CONTACTS WILL CLOSE WHEN THE CURRENT APPROCHES NORMAL FULL LOAD CONDITIONS.

WHEN REPLACING THE CURRENT STARTING RELAY ALWAYS SELECT THE APPROPRIATE RELAY FROM THE PARTS LIST. DO NOT SIZE A RELAY ON GENERAL HORSEPOWER RATINGS

COMPRESSOR MOTOR START CAPACITOR
FIGURE NO. 10

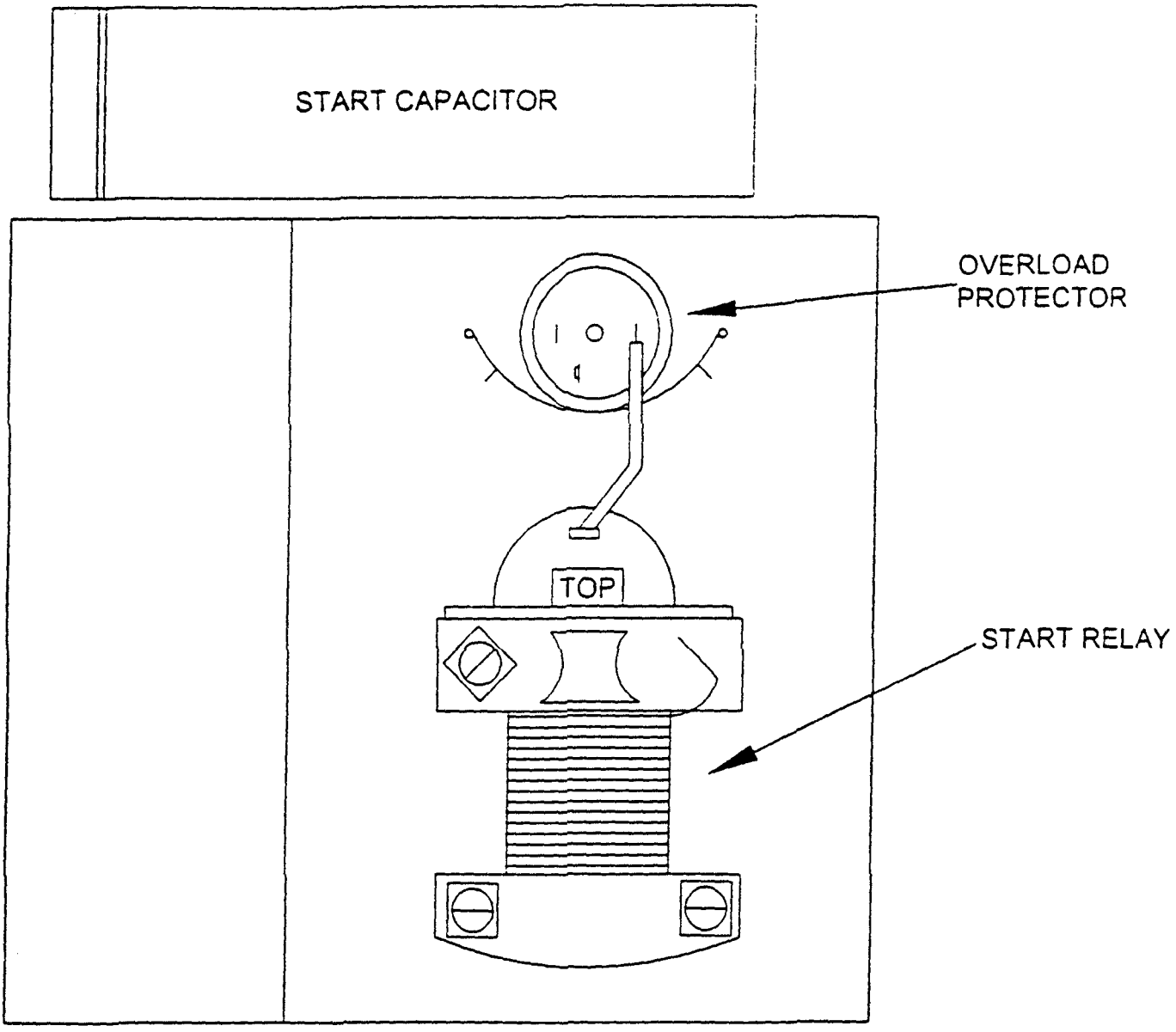


START CAPACITORS ARE USED TO PROVIDE ADDED STARTING TORQUE TO THE MOTOR. IN THIS TYPE SYSTEM THE COMPRESSOR MOTOR MAY BE REQUIRED TO START AGAINST A HIGH HEAD PRESSURE WITHOUT A START CAPACITOR THE MOTOR WOULD HOT HAVE ENOUGH STARTING TORQUE TO OVERCOME THE LOAD. ALL COMPRESSOR CAPACITORS ARE PROVIDED WITH A BLEED RESISTOR. THE USE OF CAPACITORS WITHOUT BLEED RESISTORS WILL PROBABLY RESULT IN STICKING RELAY CONTACTS AND / OR ERRATIC RELAY OPERATION. EXPECIALLY WHEN SHORT CYCLING IS LIKELY TO OCCUR.

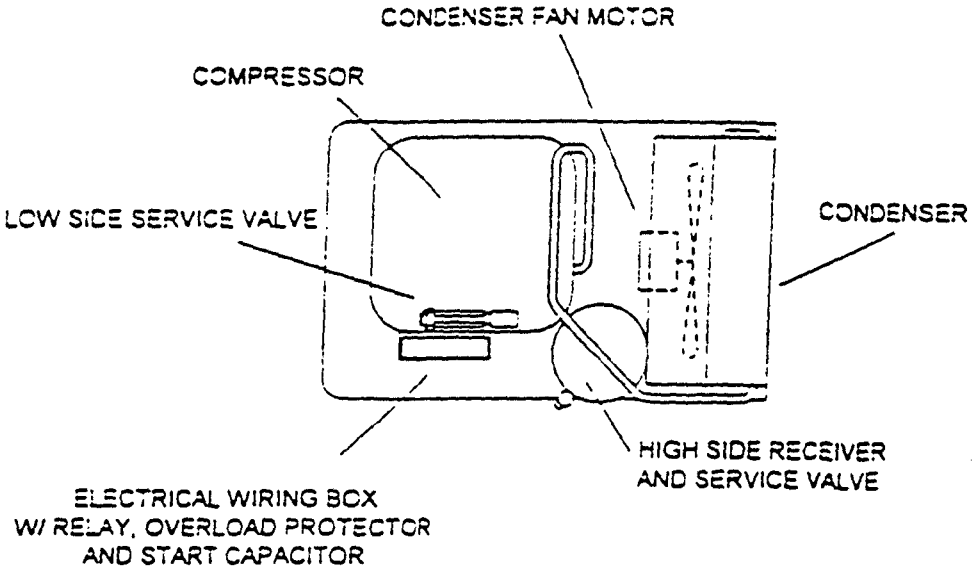
THE ERRATIC OPERATION OR STICKING WILL OCCUR DUE TO THE CAPACITOR DISCHARGING THROUGH THE RELAY CONTACTS DURING SHORT CYCLE SITUATIONS THE RESISTOR WILL ALLOW THE CAPACITOR TO DISCHARGE AT A MUCH GREATER RATE

IT IS RECOMMENDED THAT THE CAPACITOR BE REPLACED WITH THE SAME MAKE AND VALUE. IN AN EMERGENCY A 15,000 TO 18,000 OHM, TWO WATT RESISTOR SHOULD BE SOLDERED ACROSS THE TERMINALS OF THE START CAPACITOR

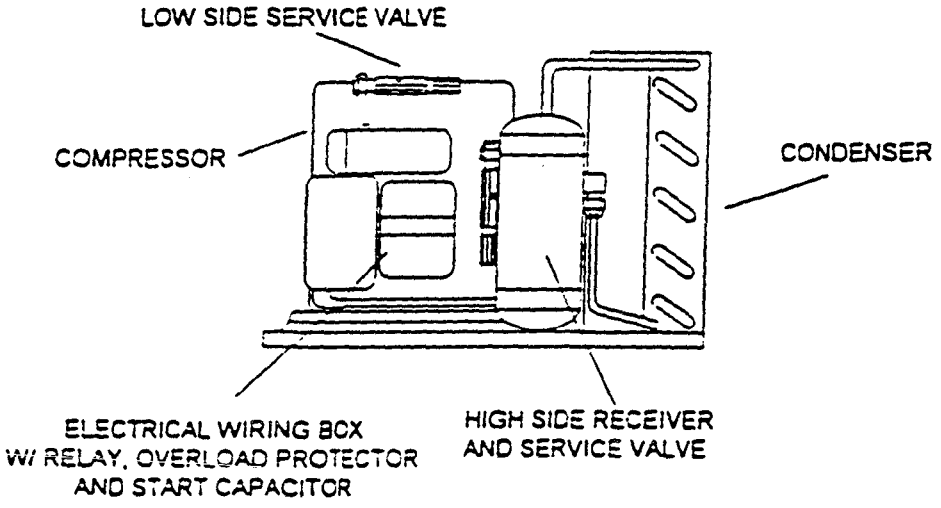
ELECTRICAL WIRING BOX PARTS IDENTIFICATION
FIGURE NO. 11



CONDENSING UNIT PARTS IDENTIFICATION
FIGURE 12



TOP VIEW



SIDE VIEW

COMPRESSOR REPAIR AND SERVICE GUIDE

*******CAUTION********

MAINTENANCE AND REPAIR OF THIS REFRIGERATOR SHOULD BE PERFORMED ONLY BY QUALIFIED REFRIGERATION PERSONNEL.

RECOMMENDED PROCEDURES FOR COMPRESSOR INSTALLATION

IT IS QUITE PROBABLE THAT A MAJORITY OF OPERATING FAILURES ON FIELD INSTALLED SYSTEMS CAN BE TRACED TO CARELESS OR INADEQUATE INSTALLATION PROCEDURES. THE FOLLOWING INSTRUCTIONS HAVE BEEN PREPARED TO HELP THE INSTALLATION AND /OR SERVICE ENGINEER TO SYSTEMATICALLY COVER THE MANY POINTS, WHICH MUST BE CONSIDERED TO PROVIDE EACH INSTALLATION WITH TROUBLE FREE PERFORMANCE.

HANDLING AND RECEIVING OF EQUIPMENT

RESPONSIBILITY SHOULD BE ASSIGNED TO A DEPENDABLE INDIVIDUAL AT THE JOB SITE TO RECEIVE MATERIAL. EACH SHIPMENT SHOULD BE CAREFULLY CHECKED AGAINST THE BILL OF LADING. THE SHIPPING RECEIPT SHOULD NOT BE SIGNED UNTIL ALL ITEMS LISTED ON THE BILL OF LADING HAVE BEEN ACCOUNTED FOR.

CHECK CAREFULLY FOR CONCEALED DAMAGE. ANY SHORTAGE OR DAMAGES SHOULD BE REPORTED TO THE DELIVERING CARRIER. DAMAGED MATERIAL BECOMES THE DELIVERING CARRIERS RESPONSIBILITY, AND SHOULD NOT BE RETURNED TO THE MANUFACTURER UNLESS PRIOR APPROVAL IS GIVEN.

WHEN UNCRATING, CARE SHOULD BE TAKEN TO PREVENT DAMAGE. THE PACKING LIST INCLUDED WITH EACH SHIPMENT SHOULD BE CAREFULLY CHECKED TO DETERMINE IF ALL PARTS AND EQUIPMENT HAS BEEN RECEIVED.

ELECTRICAL INSTALLATION

THE SUPPLY POWER, VOLTAGE, FREQUENCY AND PHASE MUST COINCIDE WITH THE COMPRESSOR NAMEPLATE. ALL WIRING SHOULD BE CAREFULLY CHECKED AGAINST THE MANUFACTURERS DIAGRAMS. FIELD WIRING MUST BE CONNECTED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.

COMPRESSOR REPAIR AND SERVICE GUIDE
(CONT.)

CAUTION

ONLY QUALIFIED REFRIGERATION PERSONNEL SHOULD PERFORM MAINTENACE AND REPAIR OF THIS REFRIGERATION SYSTEM.

CHECK TO ENSURE PROPER:

(A) WIRE SIZES TO HANDLE THE CONNECTED LOAD.

(B) START RELAY, START CAPACITOR AND OVERLOAD PROTECTOR ARE THE CORRECT ONES FOR THE COMPRESSOR.

(C) DIRECTION OF ROTATION OF FAN.

(D) WIRING WITH NO GROUNDED LINES OR CONTROLS.

INSTALLATION OF REFRIGERANT PIPING

NORMALLY A CONDENSING UNIT CAN BE INSTALLED REUSING THE FLARED END OF THE EXISTING REFRIGERATION TUBING. FOR BEST RESULTS, LUBRICATE THE FLARE SURFACE AND THE BACK OF THE TUBING FLARE WITH REFRIGERANT GRADE OIL BEFORE ASSEMBLING. IF THE COMPRESSOR ONLY IS BEING REPLACED, THEN THE TUBING ON THE OUTLET SIDE OF THE COMPRESSOR MUST BE BRAZED TO THE LINE GOING TO THE CONDENSER. IF IT BECOMES NECESSARY TO REPLACE ANY PART OF THE REFRIGERATION TUBING, TAKE EXTREME CARE TO KEEP THE TUBING CLEAN AN DRY PRIOR TO INSTALLATION. THE FOLLOWING PROCEDURES SHOULD BE FOLLOWE

(A) DO NOT LEAVE DEHYDRATED COMPRESSORS OR FILTER-DRIERS OPEN TO THE ATMOSPHERE ANY LONGER THAN IS ABSOLUTELY NECESSARY. (ONE OR TWO MINUTES MAXIMUM SUGGESTED.)

(B) USE ONLY REFRIGERATION GRADE COPPER TUBING, PROPERLY SEALED AGAINST CONTAMINATION. WATER TUBING OFTEN CONTAINS WAX AND OTHER TROUBLESOME CONTAMINANTS.

(C) PERMANENT SUCTION LINE FILTERS AND LIQUID LINE FILTER-DRIERS ARE RECOMMENDED IN ALL FIELD INSTALLED SYSTEMS.

(D) WHEN BRAZING REFRIGERANT LINE, AN INERT GAS SHOULD BE PASSED THROUGH THE LINE AT LOW PRESSURE TO PREVENT SCALING AND OXIDATION INSIDE THE TUBING. DRY NITROGEN IS PREFERRED.

COMPRESSOR REPAIR AND SERVICE GUIDE
(CONT.)

CAUTION

ONLY QUALIFIED REFRIGERATION PERSONNEL SHOULD PERFORM MAINTENANCE AND REPAIR OF THIS REFRIGERATED SERVICE STAND.

(E) LIMIT THE SOLDERING PASTE OF FLUX TO THE MINIMUM REQUIRED TO PREVENT CONTAMINATION OF THE SOLDER JOINT INTERNALLY. FLUX ONLY THE MALE PORTION OF THE CONNECTION, NEVER THE FEMALE. AFTER BRAZING, REMOVE SURPLUS FLUX WITH A DAMP CLOTH.

(F) TWO EVACUATION VALVES ARE NECESSARY. ONE SHOULD BE IN THE SUCTION LINE AND ONE IN THE LIQUID LINE AT OR NEAR THE RECEIVER.

(G) AFTER ALL LINES ARE CONNECTED, THE ENTIRE SYSTEM MUST BE LEAK TESTED. THE COMPLETE SYSTEM SHOULD BE PRESSURIZED TO NOT MORE THAN 175 PSIG WITH REFRIGERANT AND DRY NITROGEN (OR DRY CARBON DIOXIDE). THE USE OF AN ELECTRONIC TYPE DETECTOR IS HIGHLY RECOMMENDED BECAUSE OF ITS GREATER SENSITIVITY TO SMALL LEAKS. AS A FURTHER CHECK IT IS RECOMMENDED PRIOR TO CHARGING, THE SYSTEM BE EVACUATED TO A VACUUM OF 1 HG OR LESS, AND SEALED FOR 12 HOURS. ANY LEAKAGE OF AIR INTO THE SYSTEM WILL CAUSE THE VACUUM READING TO DECREASE. IF AN AIR LEAK IS INDICATED, THE SYSTEM SHOULD AGAIN BE LEAK TESTED, AND LEAKS REPAIRED. FOR A SATISFACTORY INSTALLATION, THE SYSTEM SHOULD BE LEAK TIGHT.

(H) AFTER THE FINAL LEAK TEST, SUCTION LINES SHOULD BE INSULATED TO PREVENT CONDENSATION.

EVACUATION

A GOOD HIGH VACUUM PUMP SHOULD BE CONNECTED TO BOTH THE LOW AND HIGH SIDE EVACUATION VALVES WITH COPPER TUBE OR VACUUM HOSES (1/4" ID MINIMUM). IF THE COMPRESSOR HAS SERVICE VALVES, THEY SHOULD REMAIN CLOSED. A HIGH PRESSURE GAUGE CAPABLE OF REGISTERING VACUUM IN Hg, AND PRESSURE IN psig SHOULD BE ATTACHED TO THE SYSTEM FOR VACUUM AND PRESSURE READINGS.

START UP AND CHECK LIST

*****CAUTION*****

ONLY QUALIFIED REFRIGERATION PERSONNEL SHOULD PERFORM MAINTENANCE AND REPAIR OF THIS REFRIGERATED SERVICE STAND.

AFTER THE INSTALLATION HAS BEEN COMPLETED, THE FOLLOWING POINTS SHOULD BE COVERED BEFORE THE SYSTEM IS PLACED IN OPERATION:

*****WARNING*****

TO PREVENT ELECTRICAL SHOCK HAZARD, ALL POWER SHOULD BE REMOVED FROM THE UNIT BEFORE PROCEEDING.

(A) CHECK ELECTRICAL CONNECTIONS. BE SURE THEY ARE TIGHT.

(B) WIRING DIAGRAMS, INSTRUCTION BULLETINS, ETC., ATTACHED TO THE COMPRESSOR OR CONDENSING UNITS SHOULD BE READ AND FILED FOR FUTURE REFERENCE.

(C) CHECK THE SETTINGS ON THE LOW PRESSURE CONTROL. THE CUT IN SHOULD BE SET AT 40 AND THE CUT-OUT AT 15.

(D) USING A GAUGE MANIFOLD SET,CHARGE THE UNIT WITH THE REFRIGERANT TO BE USED.THEMANIFOLDHOSES SHOULD BE PURGED OF AIR WITH REFRIGERANT BEFORE ADDING REFRIGERANT TO THE SYSTEM. REFRIGERANT SHOULD BE ADDED IN VAPOR FORM ONLY WHEN ADDED TO THE SUCTION SIDE OF THE COMPRESSOR. WEIGH THE REFRIGERANT DRUM BEFORE CHARGING SO AN ACCURATE RECORD CAN BE KEPT OF THE WEIGHT OF REFRIGERANT PUT IN THE SYSTEM.

(E) CONTINUE CHARGING UNTIL THE SYSTEM HAS SUFFICIENT REFRIGERANT FOR PROPER OPERATION. DO NOT OVERCHARGE. REMEMBER THAT BUBBLES IN A SIGHT GLASS MAY BE CAUSED BY A RESTRICTION AS WELL AS A SHORTAGE OF REFRIGERANT.

(F) DO NOT LEAVE THE UNIT UNATTENDED UNTIL THE SYSTEM HAS REACHED NORMAL OPERATING CONDITIONS.

OPERATIONAL CHECK OUT

CAUTION

ONLY QUALIFIED REFRIGERATION PERSONNEL SHOULD PERFORM MAITENANCE AND REPAIR OF THIS REFRIGERATED SERVICE STAND.

AFTER THE SYSTEM HAS BEEN CHARGED AND OPERATED FOR AT LEAST TWO HOURS AT NORMAL OPERATING CONDITIONS WITHOUT ANY INDICATION OF MALFUNCTION, IT SHOULD BE ALLOWED TO OPERATE OVERNIGHT ON AUTOMATIC CONTROLS. THE SYSTEM SHOULD THEN BE RECHECKED AS FOLLOWS:

(A) CHECK COMPRESSOR HEAD AND SUCTION PRESSURES. THE SUCTION PRESSURE SHOULD BE WITHIN THE SETTINGS OF THE LOW PRESSURE CONTROL. THE HEAD PRESSURE SHOULD NOT EXCEED 200 AT NORMAL AMBIENT TEMPERATURE. (75 DEG. F)

(B) CHECK THE LIQUID LINE SIGHT GLASS. IF THERE ARE INDICATIONS THAT MORE REFRIGERANT IS REQUIRED, LEAK TEST ALL CONNECTIONS AND SYSTEM COMPONENTS AND REPAIR ANY LEAKS BEFORE ADDING REFRIGERANT.

(C) USING A VOLT METER AND AN AMPMETER. CAREFULLY CHECK THE VOLTAGE AND AMPERAGE AT THE COMPRESSOR TERMINALS. VOLTAGE MUST BE WITHIN 10% OF THAT INDICATED ON THE COMPRESSOR NAME PLATE. IF HIGH OR LOW VOLTAGE IS INDICATED, NOTIFY THE POWER SUPPLIER. THE CURRENT NORMALLY SHOULD NOT EXCEED 120% OF THE NAME PLATE RATING. IF THE AMPERAGE DRAW IS EXCESSIVE, CHECK TO SEE IF THERE IS A RESTRICTION IN THE LIQUID SIDE, AN EXCESSIVELY HIGH HEAD PRESSURE OR A RESTRICTION IN THE AIR FLOW ACROSS THE CONDENSER.

EXPANSION VALVE REMOVAL AND INSTALLATION

TO REMOVE AN EXPANSION VALVE FOR CLEANING OR REPLACEMENT FOLLOW THESE STEPS.

1. REMOVE ALL ELECTRICAL POWER FROM THE REFRIGERATED SERVICE STAND.

*****CAUTION*****

WEAR EYE PROTECTION WHEN REDUCING REFRIGERATION SYSTEM PRESSURE.

2. REDUCE THE REFRIGERATION SYSTEM PRESSURE TO -0- PSI.

3. REMOVE THE BULB FROM THE EVAPORATOR TUBING.

4. USING A TORCH ON BOTH ENDS OF THE VALVE BODY AND UNSOLDER THE VALVE FROM THE TUBING AND TAKE THE EXPANSION OUT OF THE REFRIGERATOR.

*********WARNING*********

IF REPLACING THE VALVE, REPLACE WITH ONLY THE EXACT TYPE AS THE OLD ONE. REMOVE THE SEAL CAP FROM THE OLD VALVE AND TURN THE ADJUSTMENT STEM COUNTERCLOCKWISE UNTIL THE STOP IS REACHED. COUNT AND RECORD THE NUMBER OF TURNS SO THE ADJUSTMENT ON THE NEW VALVE CAN BE SET AT THE SAME POSITION AS THE OLD ONE.

TO INSTALL AN EXPANSION VALVE FOLLOW THESE STEPS:

1. REMOVE THE SEAL CAP FROM THE BOTTOM OF THE NEW VALVE AND TURN THE STEM TO THE SAME POSITION A THE OLD VALVE.

2. USING A TORCH ON BOTH ENDS OF THE VALVE BODY AND RESOLDER THE VALVE TO THE TUBING.

3. CLAMP THE BULB TO THE EVAPORATOR TUBING IN THE SAME POSITION AS THE OLD BULB.

4. EVACUATE THE SYTEM TO REMOVE MOISURE AND CHECK FOR LEAKS. IF NO LEAKS ARE FOUND, RECHARGE THE SYSTEM WITH REFRIGERANT.

5. OBSERVE THE PERFORMANCE OF THE SYSTEM TO MAKE SURE THAT IT IS FUNCTIONING PROPERLY.ALLOW THE REFRIGERATOR TO RUN OVERNIGHT ON THE AUTOMATIC CONTROLS BEFORE PLACING FOOD IN IT.

EXPANSION VALVE INSPECTION AND CLEANING

IT IS FREQUENTLY ASSUMED THAT IF A VALVE DOES NOT FEED PROPERLY, IT IS STUCK (EITHER OPEN OR CLOSED). BEATING THE VALVE WITH A HAMMER WILL ONLY DISTORT THE BODY AND MAKE IT IMPOSSIBLE FOR THE VALVE TO WORK ONCE THE REAL CAUSE IS DETERMINED. IF A VALVE STICKS IT IS USUALLY DUE TO MOISTURE FREEZING IN THE PORT, DIRT AND OTHER FOREIGN MATERIAL RESTRICTING OR PLUGING THE INTERNAL PARTS, WAX FORMING ON THE INTERNAL PARTS AT LOW TEMPERATURES, OR THE VALVE HAS BEEN PHYSICALLY ABUSED SO THAT IT CAN NOT FUNCTION. THE REMEDY IS TO INSPECT THE VALVE AND ITS INTERNAL PARTS, INCLUDING THE INLET STRAINER. IF PLUGGED OR RESTRICTED IN ANY WAY, CLEAN THE PARTS THROUGHLY, OIL THE PARTS.IF THE VALVE IS BEYOND NORMAL CLEANING PROCESSES, OR IT IS PHYSICALLY DAMAGED IN ANY WAY, REPLACE THE VALVE WITH ITS PROPER REPLACEMENT MODEL.

1. REMOVE THE VALVE FROM THE REFRIGERATION SYSTEM AS DESCRIBED ON PAGE 24.

2. REMOVE THE SEAL CAP AND TURN THE ADJUSTMENT STEM COUNTER-CLOCKWISE TO RELIEVE THE SPRING FORCE. COUNT AND RECORD THE NUMBER OF TURNS SO ADJUSTMENT CAN BE RETURNED TO ITS ORIGINAL POSITION. SEE PAGE 12.

*********WARNING*********

REGARDLESS OF WHETHER THE VALVE IS IN A WRENCH OR IN A VISE, CARE MUST BE TAKEN TO PREVENT DISTORTING THE BODY BY EXERTING TOO MUCH PRESSURE IN TIGHTENING THE ELEMENT OR IN CLAMPING THE BODY IN THE VISE. DO NOT USE A WRENCH ON THE OUTERWELDED EDGE OF THE THERMOSTATIC ELEMENT.

3. USING APPROPRIATE WRENCHES OR A VISE TO PROPERLY SUPPORT THE VALVE BODY REMOVE THE THERMOSTATIC ELEMENT, THE BOTTOM CAP ASSEMBLY AND THE INTERNAL PARTS.

4. INSPECT PARTS, ELEMENT, AND BODY FOR ANY FOREIGN MATERIALS OR PHYSICAL DAMAGE.

EXPANSION VALVE INSPECTION AND CLEANING
(CONT.)

CAUTION

WEAR EYE PROTECTION WHEN CLEANING PARTS. WHEN BLOWING OFF PARTS USE ONLY OHSA APPROVED AIR NOZZLES WITH A MAZIMUM PRESSURE OF 30 PSIG. HEARING PROTECTION IS ALSO RECOMMENDED WHEN USING A COMPRESSED AIR NOZZLE.

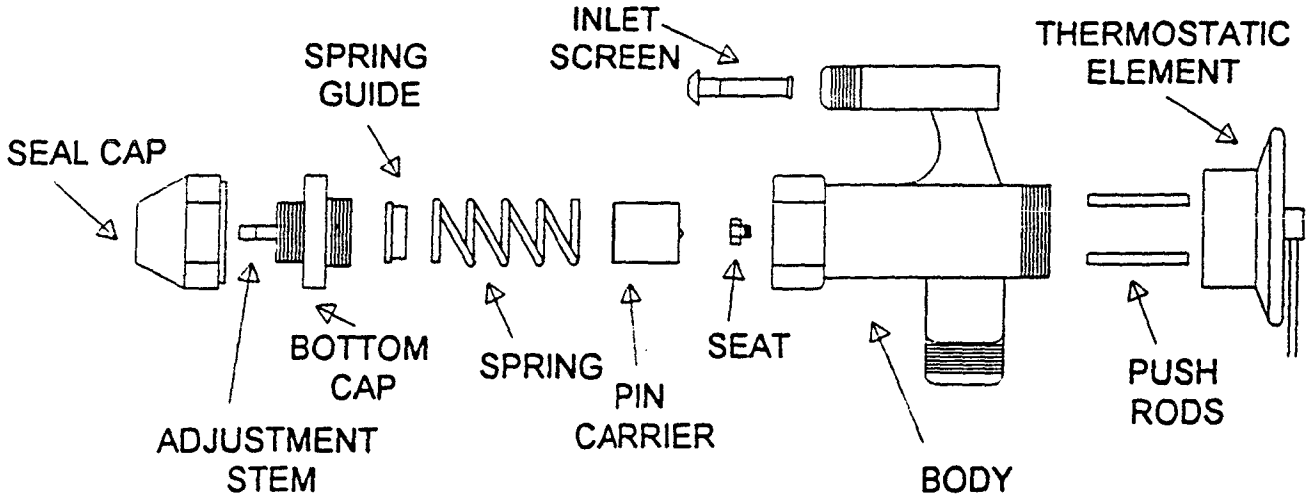
5. CLEAN ALL PARTS WITH SOLVENT, PREFERABLY BY APPLYING AND THEN BLOWING OFF WITH CLEAN DRY COMPRESSED AIR. THE INLET SCREEN CAN BE CLEANED WITHOUT REMOVING IT BY APPLYING SOLVENT AND BACK FLUSHING WITH CLEAN DRY COMPRESSED AIR THROUGH THE VALVE SEAT ON THE INSIDE OF THE VALVE. DO NOT TOUCH THE VALVE SEAT WITH AND AIR NOZZLE TO PREVENT SCARRING THE SEAT AND RUINING THE VLAVE.

6. OIL THE PARTS WITH A GOOD GRADE OF REFRIGERANT OIL AND REASSEMBLE THEM. SEE FIGURE NO. 13 BELOW. BE SURE TO TURN THE ADJUSTMENT STEM BACK TO ITS ORIGINAL POSITION AFTER ASSEMBLING THE VALVE.

CAUTION

FAILURE TO ADJUST THE STEM BACK TO ITS ORIGINAL (CORRECT) POSITION MAY RESULT IN COMPRESSOR DAMAGE OR POOR EVAPORATOR PERFORMANCE.

EXPANSION VALVE EXPLODED VIEW
FIGURE 13



SPORLAN CATCH-ALL # C-052 FILTER-DRIER

SURFACE FILTERING AREA:	15 SQ. INCHES
WATER CAPACITY DROPS @ 15 PPM	57
REFRIGERANT FLOW CAPACITY:	2.9 TONS @ 2 PSI
CONNECTIONS:	1/4" FEMALE SWEAT
VOLUME OF DESICCANT:	5 CUBIC INCHES

REPLACEMENT OF CATCH-ALL # C-052 FILTER-DRIER

1. REMOVE ALL ELECTRICAL POWER FROM REFRIGERATED SERVICE STAND.

*****CAUTION******

USE EYE PROTECTION WHEN REDUCING REFRIGERATION SYSTEM PRESSURE.

2. REDUCE REFRIGERATION SYSTEM PRESSURE TO -0- PSI.

3. USING A TORCH UNSOLDER THE CATCH-ALL FROM THE TUBING.

4. IF THE SEE-ALL IS NOT BEING REPLACED, ASSEMBLE THE NEW FILTER-DRIER TO THE SEE-ALL AND SOLDER THE CATCH-ALL TO THE TUBING. BE SURE THAT THE ARROW ON THE NEW FILTER-DRIER POINTS IN THE DIRECTION THAT THE REFRIGERANT IS TRAVELING.

5. EVACUATE THE SYSTEM TO REMOVE MOISTURE AND LEAK TEST THE NEW CONNECTIONS. IF THERE ARE NO LEAKS, RECHARGE WITH REFRIGERANT

6. RESTART THE SYSTEM AND OBSERVE THE SEE-ALL TO MAKE SURE THAT REFRIGERANT FLOWS THROUGH THE FILTER-DRIER AND SEE-ALL PROPERLY.

REPLACEMENT OF THE DUAL PRESSURE CONTROL

1. DISCONNECT ALL ELECTRICAL POWER TO THE REFIGERATED SERVICE STAND

2. CLOSE THE PORT ON THE LOW-PRESSURE SIDE SERVICE VALVE BY TURNING IT FULLY COUNTER CLOCKWISE. SEE FIG. 12 ON PAGE 18.

3. SLOWLY REMOVE THE FLARE NUT FROM THE SERVICE VALVE AND REMOVE THE TUBE FROM THE SERVICE VALVE.

4. REMOVE THE COVER FROM THE DUAL-PRESSURE CONTROL AND DISCONNECT THE TWO WIRES FROM THE TERMINALS.

5. REMOVE THE CONDUIT (WITH THE WIRES INSIDE) FROM THE DUAL-PRESSURE CONTROL.

6. REMOVE THE DUAL-PRESSURE CONTROL FROM ITS HOLDING BRACKET BY REMOVING THE TWO SCREWS.

7. INSTALL THE NEW DUAL-PRESSURE CONTROL BY REVERSING THE ABOVE STEPS. BE SURE TO LUBRICATE THE FLARE SURFACE OF THE SERVICE VALVE AND THE BACK OF THE TUBING FLARE WITH REFRIGERATION GRADE OIL BEFORE ASSEMBLING THE TUBING TO THE SERVICE VALVE. ADJUST THE SETTINGS ON THE NEW DUAL PRESSURE CONTROL TO CUT-IN - 40 DIFFERENTIAL - 15 AND THE HIGH PRESSURE CUT OUT - 300 BEFORE RESTARTING THE REFRIGERATOR.

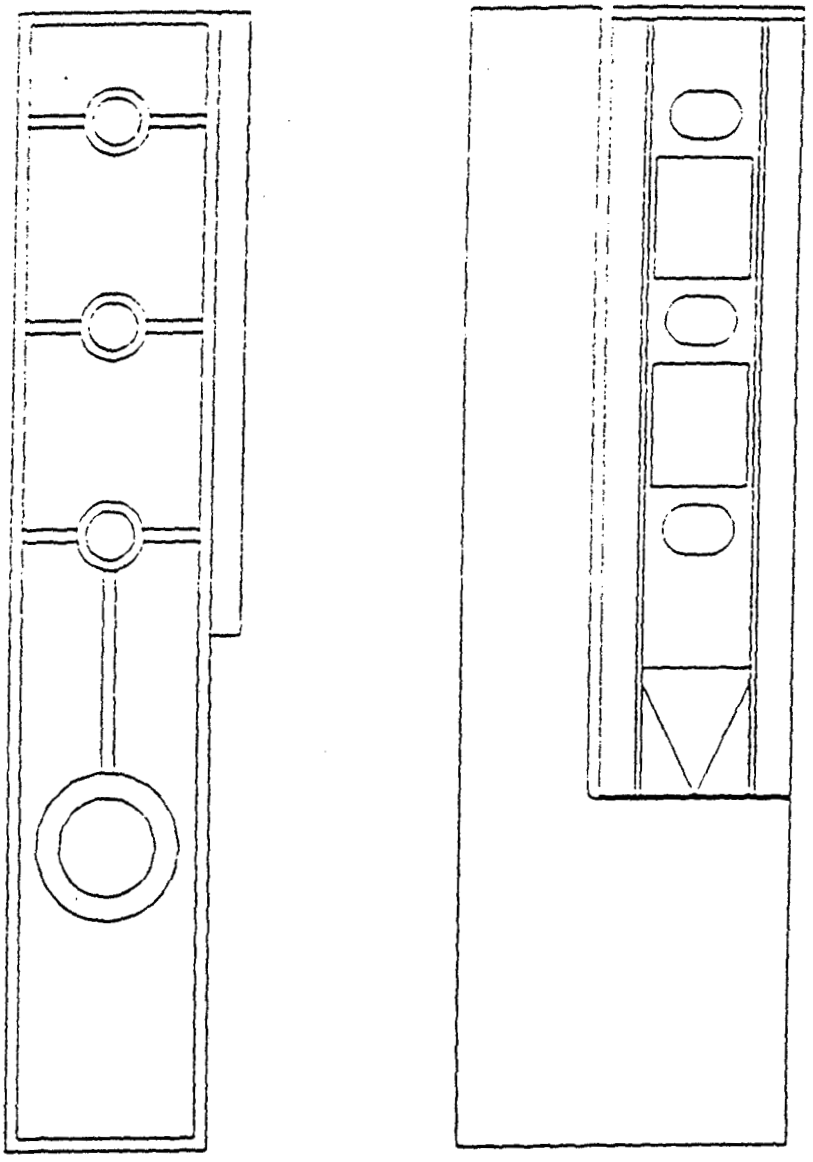
REFRIGERATION SERVICE CHART

COMPLAINT	PROBLEM	SOLUTION
A. COMPRESSOR WILL NOT START	1. LINE DISCONNECT SWITCH OPEN	1. CLOSE START OR SWITCH DISCONNECT
	2. FUSE REMOVED OR BLOWN	2. REPLACE FUSE
	3. CONTROL STUCK IN OPEN POSITION	3. REPAIR OR REPLACE CONTROL
	4. CONTROL OFF DUE TO COLD LOCATION	4. RELOCATE CONTROL
B. COMPRESSOR WILL NOT START, HUMS BUT TRIPS OVERLOAD PROTECTOR	1. LOW VOLTAGE TO UNIT	1. CALL POWER SUPPLIER
	2. STARTING CAPACITOR DEFECTIVE	2. REPLACE CAPACITOR
	3. RELAY FAILING TO CLOSE	3. REPLACE RELAY
	4. COMPRESSOR MOTOR HAS A WINDING OPEN OR SHORTED	4. REPLACE COMPRESSOR
	5. INTERNAL MECHANICAL TROUBLE IN COMPRESSOR	5. REPLACE COMPRESSOR
C. COMPRESSOR STARTS BUT DOES NOT SWITCH OFF OF START WINDING	1. LOW VOLTAGE TO UNIT	1. CALL POWER SUPPLIER
	2. RELAY FAILING TO OPEN	2. REPLACE RELAY
	3. RUN CAPACITOR DEFECTIVE	3. REPLACE CAPACITOR
	4. EXCESSIVELY HIGH DISCHARGE OVERCHARGE OR INSUFFICIENT	4. CHECK DISCHARGE SHUT COOLING CONDENSER.
	5. COMPRESSOR MOTOR HAS A WINDING OPEN OR SHORTED	5. REPLACE COMPRESSOR
	6. INTERNAL MECHANICAL TROUBLE IN COMPRESSOR (TIGHT)	6. REPLACE COMPRESSOR
D. COMPRESSOR STARTS AND RUNS, BUT SHORT CYCLES ON OVERLOAD PROTECTOR	1. LOW VOLTAGE TO UNIT	1. CALL POWER SUPPLIER
	2. OVERLOAD PROTECTOR DEFECTIVE	2. CHECK CURRENT, REPLACE PROTECTOR
	3. RUN CAPACITOR DEFECTIVE	3. REPLACE CAPACITOR
	4. EXCESSIVE DISCHARGE	4. CHECK VENTILATION, IN REFRIGERANT SYSTEM
	5. CHECK REFRIGERANT CHARGE RETURN GAS HOT	5. COMPRESSOR TOO HOT, (FIX LEAK IF NECESSARY)
	6. COMPRESSOR MOTOR HAS A WINDING SHORTED	6. REPLACE COMPRESSOR
E. **UNITS RUNS OK, BUT SHORT CYCLES ON:**	1. OVERLOAD PROTECTOR	1. SEE D-2 ABOVE
	2. THERMOSTAT CLOSE,	2. DIFFERENTIAL SET TOO WIDEN
	3. HIGH PRESSURE CUT OUT DUE TO:	
	A. INSUFFICIENT AIR	3A. CHECK AIR SUPPLY TO CONDENSER
	B. OVERCHARGE	3B. REDUCE REFRIGERANT CHARGE
	C. AIR IN SYSTEM	3C. PURGE
	4. LOW PRESSURE CUT-OUT DUE TO:	

REFRIGERANT SERVICE CHART (CONT.)

COMPLAINT	PROBLEM	SOLUTION
	A. UNDERCHARGED	4A. FIX LEAK AND ADD REFRIGERANT
	B. EXPANSION VALVE OUT OF ADJUSTMENT.	4B. RE-ADJUST VALVE
	C. RESTRICTION IN EXPANSION VALVE.	4C. REPLACE VALVE
F. UNIT OPERATES LONG OR CONTINUOUSLY	1. SHORTAGE OF REFRIGERANT	1. FIX LEAK, ADD CHARGE
	2. CONTROL CONTACTS STUCK OR FROZEN CLOSED.	2. CLEAN CONTACTS, OR REPLACE CONTROL.
	3. REFRIGERANT OR AIR CONDITIONED SPACE HAS EXCESSIVE LOAD OR POOR INSULATION	3. DETERMINE FAULT AND CORRECT
	4. EVAPORATOR COIL ICED	.4. DEFROST
	5. RESTRICTION IN REFRIGERANT SYSTEM	5. DETERMINE LOCATION AND REMOVE
	6. DIRTY CONDENSER	6. CLEAN CONDENSER
	7. FILTER DIRTY	7. CLEAN OR REPLACE
G. START CAPACITOR OPEN	1. RELAY CONTACTS NOT OPENING PROPERLY	1. CLEAN CONTACTS OR REPLACE IF NECESSARY
	2. PROLONGED OPERATION ON START CYCLE DUE TO:	
	A. LOW VOLTAGE TO UNIT	2A. CALL POWER SUPPLIER
	B. IMPROPER RELAY	2B. REPLACE
	3. EXCESSIVE SHORT CYCLE	3. DETERMINE REASON FOR SHORT CYCLE
H. RUN CAPACITOR OPEN, SHORTED OR BLOWN	1. IMPROPER CAPACITOR	1. DETERMINE CORRECT SIZE AND REPLACE
	2. EXCESSIVELY HIGH LINE VOLTAGE (100% OF RATED-MAX)	2. CALL POWER SUPPLIER
I. SPACE TEMPERATURE TOO HIGH	1. CONTROL SETTING TOO HIGH	1. RESET (CONTROL)
	2. INADEQUATE AIR CIRCULATION	2. IMPROVE AIR MOVEMENT
J. SUCTION LINE FROSTED OR SWEATING	1. EXPANSION VALVE STUCK	1. CLEAN VALVE OF FOREIGN PARTICLES, REPLACE IF NECESSARY.
	2. EVAPORATOR FAN NOT RUNNING	2. DETERMINE REASON AND CORRECT
	3. OVERCHARGE OF REFRIGERANT	3. CORRECT CHARGE

KASON CAM LIFT HINGE
ITEM NO. 25, MODEL NO. 1267,
FIGURE 14



SPECIFICATIONS FOR MODEL NO. 1267

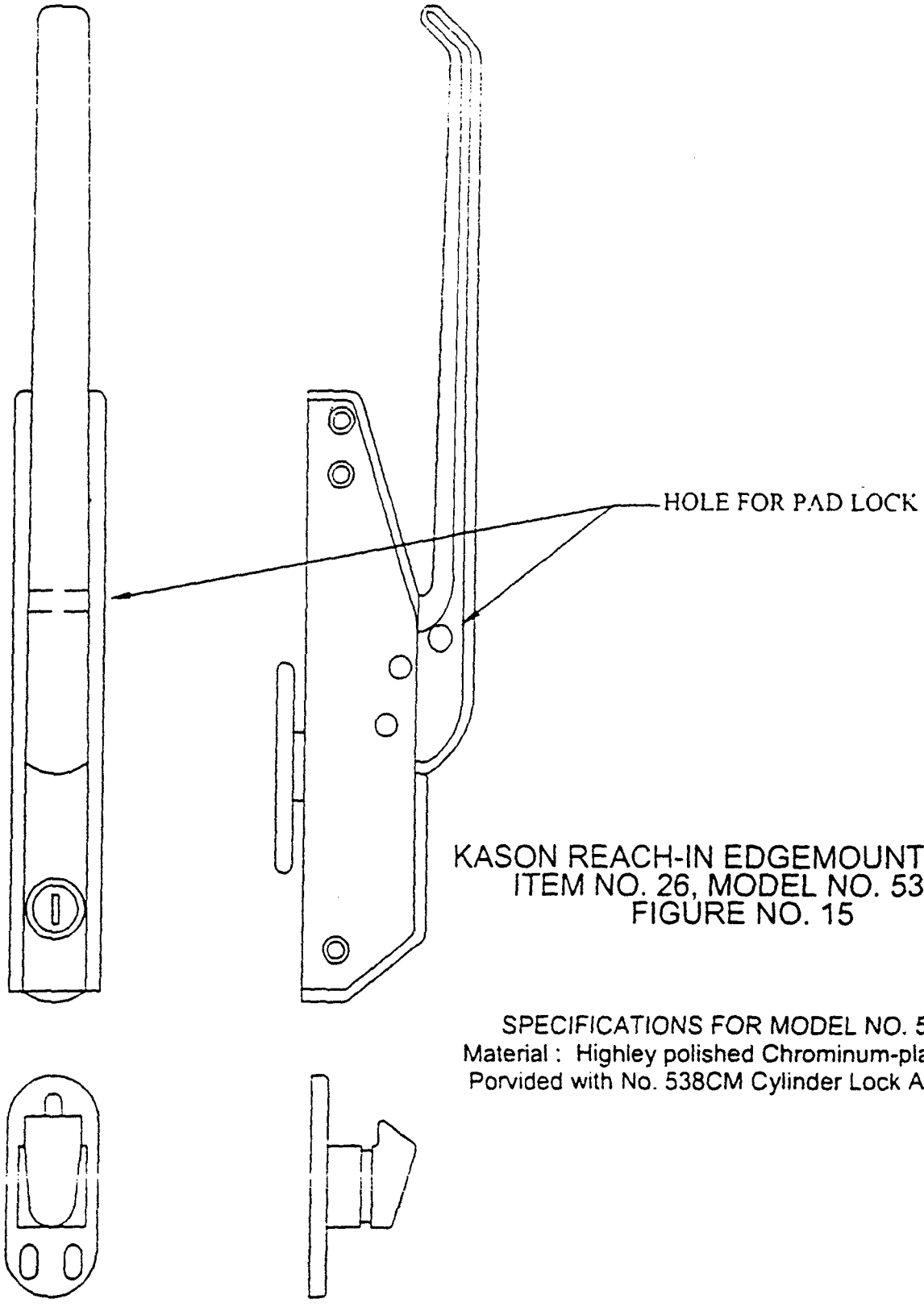
Material: High-pressure, die-cast zinc

Finish: Highly polished, chromium-plated

For doors having offsets from: 1-5/8" (41.3 mm)

flange and strap drilled for no. 12 (5.5 mm) flat head screws

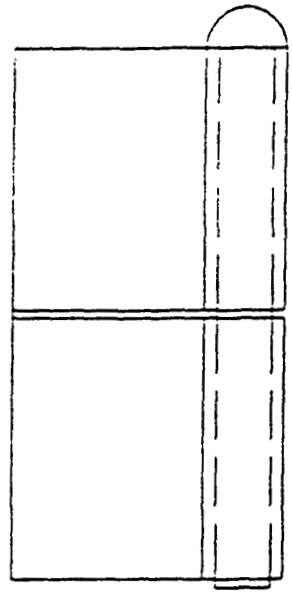
Adjustment plate permits adjustment of 3/16" (4.8 mm)



KASON REACH-IN EDGEMOUNT LATCH
ITEM NO. 26, MODEL NO. 538-C
FIGURE NO. 15

SPECIFICATIONS FOR MODEL NO. 538-C
Material : Highley polished Chrominum-plated
Porvided with No. 538CM Cylinder Lock Assembly

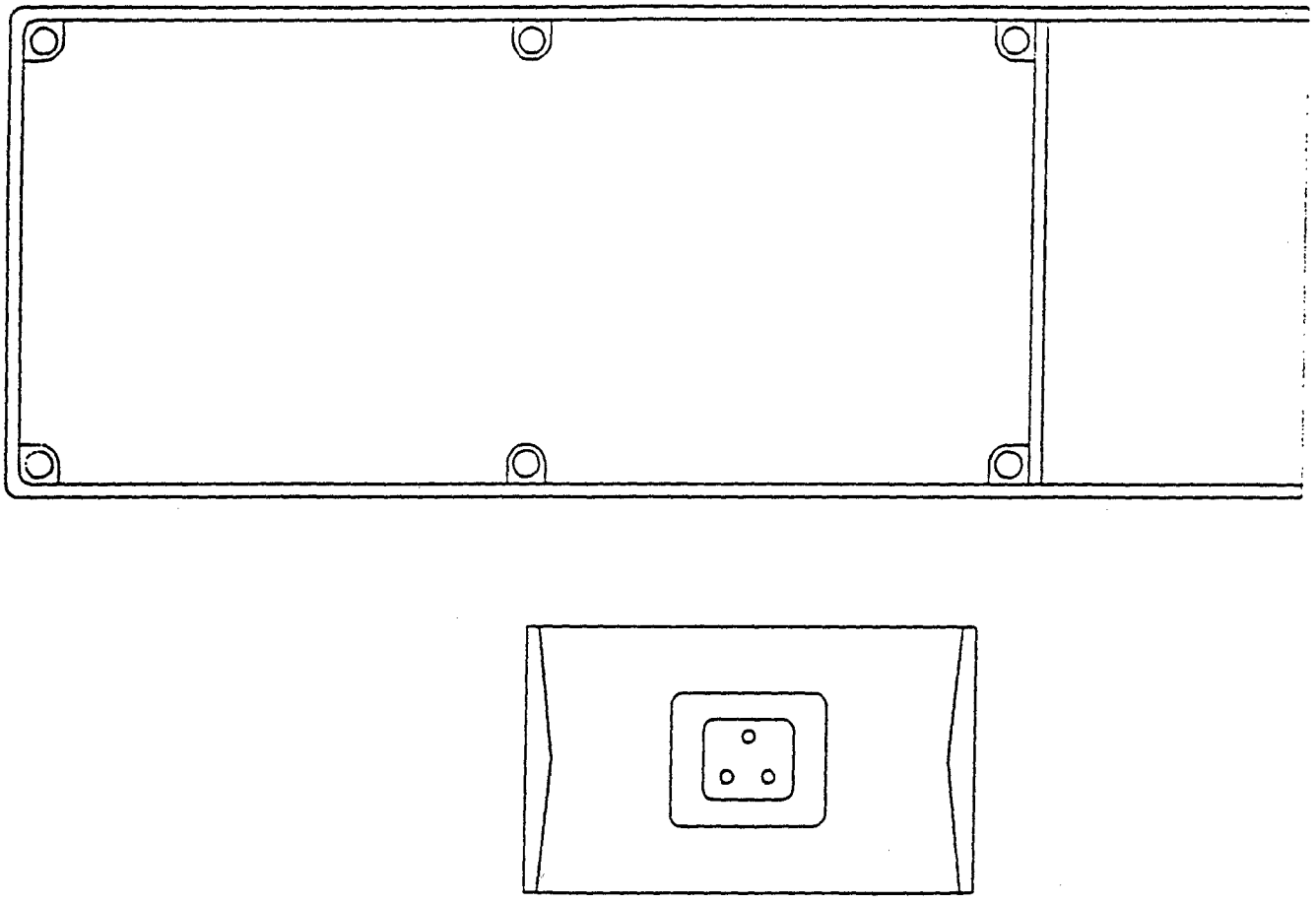
COMPONENT HARDWARE
LIFT OFF FLAG HINGE
ITEM NO. 34, MODEL NO. M75-1002
FIGURE NO. 16



Specifications: Stainless steel
2-1/16" x 1-3/32" x .072
Non handed, no mortising of doors required

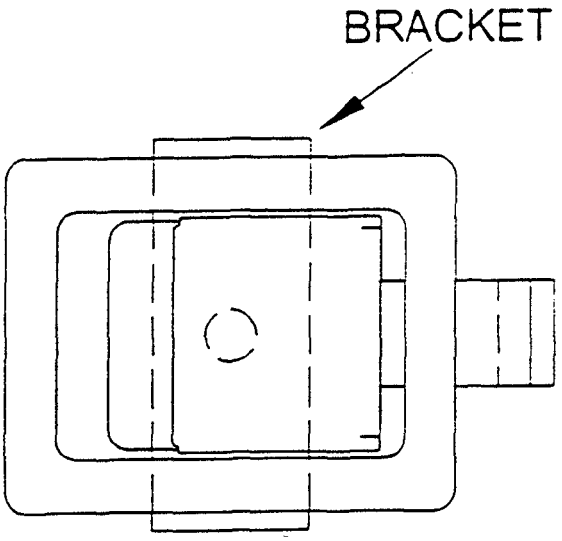
FOR DRY STORAGE AREA IF REQUIRED

COMPONENT HARDWARE
CONDENSATE EVAPORATOR
ITEM NO. 24, MODEL T12-0370
FIGURE NO. 17

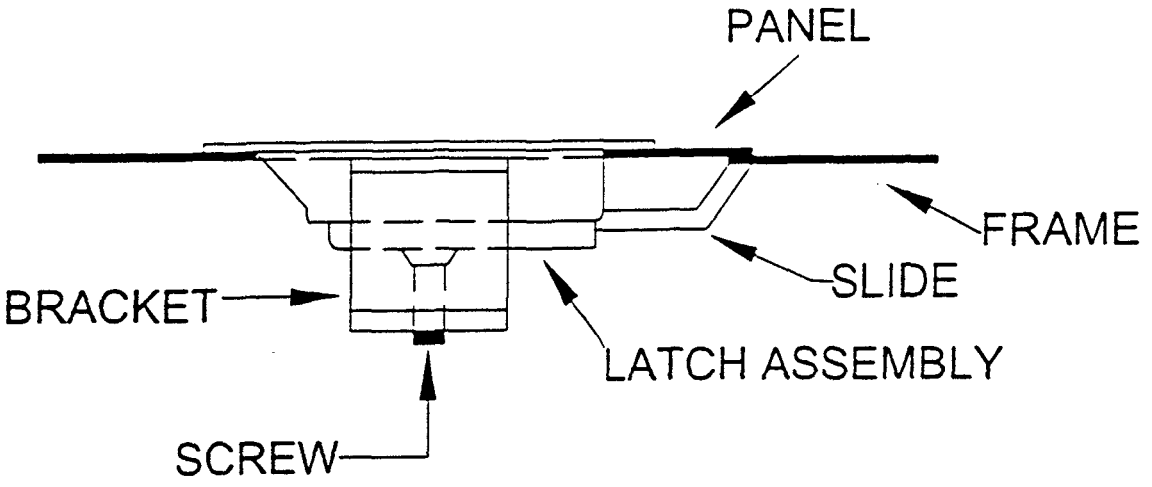


Specifications: For Model T12-5000
Volume: 50 fluid ounces
Pan: Die cast aluminum 4-3/4" x 12-1/2" x 2-3/4"
Cord Set: 18" leads, molded plugs
Rating: 117 Volts, 250 Watts

SOUTHCO PADDLE LATCH
ITEM NO. 36, MODEL 64-10-103-50
FIGURE NO. 18



FOR DRY STORAGE
AREA DOORS IF REQUIRED



SPECIFICATIONS FOR MODEL 64-10-103-50

Cup: 305 stainless steel, brushed finish

Paddle: 302 stainless steel, passivated plus brushed finish

Cover: 302 stainless steel, natural

Slide: 1010 steel, chrome plated

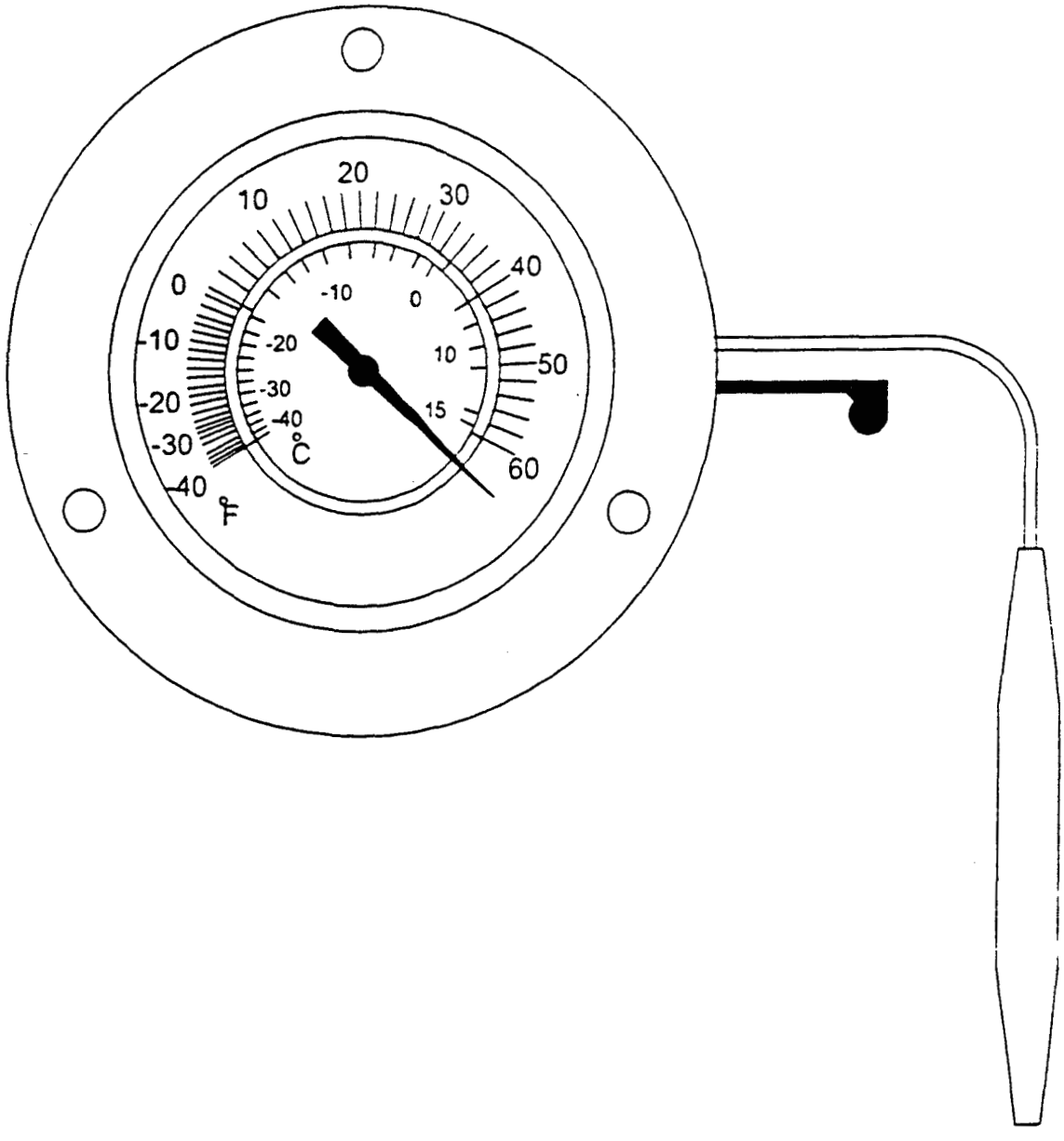
Bracket: 1010 steel, DACROTIZED.

Spring: 302 stainless steel, passivated

Pin: 1018 steel zinc plated plus bright chromate dip

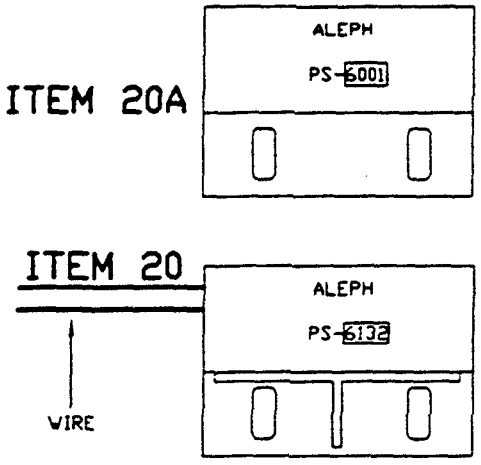
Screw: 1010 steel zinc plated bright chromate dip

MILJOCO THERMOTER
ITEM NO. 23, MODEL 6812-01
FIGURE NO. 19

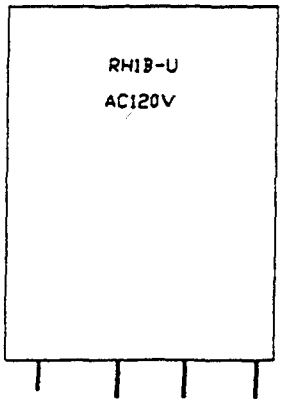


Specifications: 2" diameter dial thermometer with 6" capilary
Chrome plated back flange mount
Temperature range from -40 to +60 degrees F

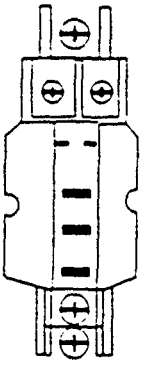
MAGNETIC DOOR SENSORS



RELAY
ITEM 20B

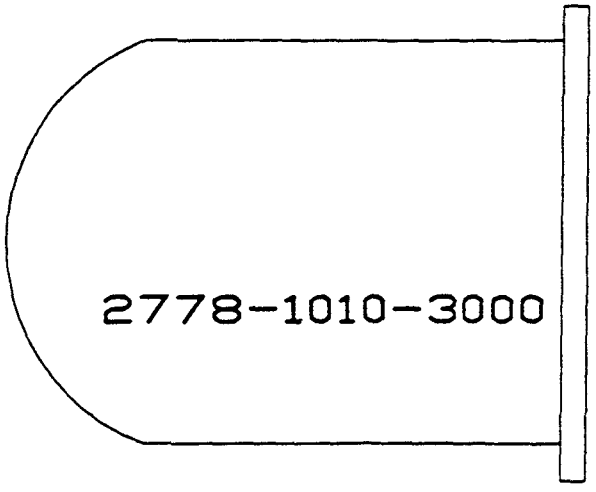


RELAY BASE
ITEM 20C

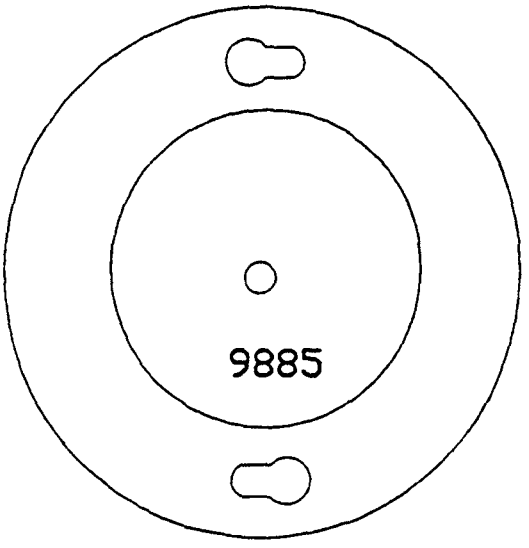


IDEC
SH1B-05

LIGHT GUARD & RECEPTACLE



ITEM 21



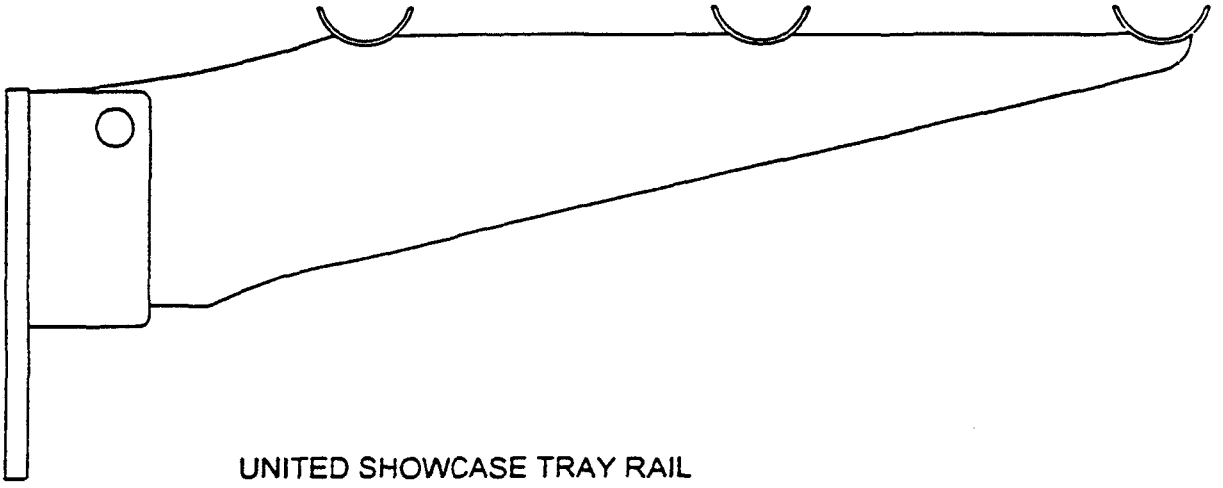
ITEM 22

FIGURE 20

UNITED SHOWCASE TRAY RAIL BRACKET

ITEM NO. 33 MODEL NO. TS39

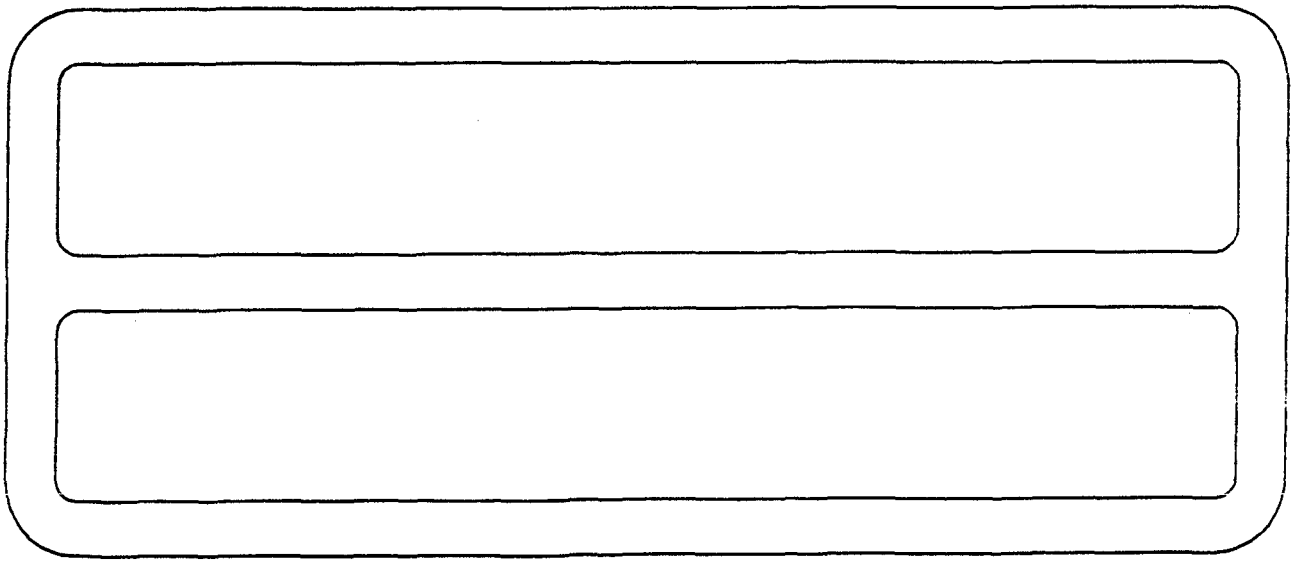
FIGURE NO. 21



UNITED SHOWCASE TRAY RAIL

ITEM NO. 32, MODEL NO. TS38

FIGURE NO. 21



PARTS LIST
FOR SERVICE STAND WITH REFRIGERATED BASE FOR SHIPBOARD USE

ITEM NO.	PART NAME	QUANTITY	STOCK NO.	MFG. PART NO.
1	CONDENSING UNIT	1	311935	M2FH-0040-IAA-212
2	START CAPACITOR	1	N/A	014-0038-04
3	RELAY	1	N/A	040-C411-83
4	OVERLOAD PROTECTOR	1	N/A	071-0554-25
5	COMPRESSOR	1	311987	ARE41C3E-IAA
6	CONDENSER FAN MOTOR	1	N/A	083-0142-00
7	CONDENSER FAN BLADE	1	N/A	050-0259-00
8				
9	CORD SET	1	251210	14/3 SJTO
10	DRIER	1	282310	C-052-T
11	LIQUID LEVEL	1	282400	SA-12S
12	EXPANSION VALVE	1	282577	Y1017-FJ-1/6-C
13	UNIT COOLER	1	312000	KMK-13AF
	OR			
13A	UNIT COOLER	1	312020	MDF-27-13
14	FAN BLADE	2	312002	5102-C
	OR			
14A	FAN BLADE	2	312023	105849002
15	FAN MOTOR	2	312001	5021SS
	OR			
15A	FAN MOTOR	2	312021	102249005
16	DUAL PRESS. CONTROL	1	280610	012-4834-000
17	4" JUNCTION BOX	1	356300	52151-1/2
18	BLANK COVER	1	356100	52-C-1
19	TOGGLE SWITCH	1	335900	90-0001
20	LIGHT ACTUATOR	1	336100	PS-6132
20A	SENSOR, MAGNETIC	1	336110	PS-6001
20B	RELAY	1	515851	RH1B-U
20C	RELAY BASE	1	515840	SH1B-05
21	LIGHT GUARD	2	534100	L20-2778
22	LIGHT RECEPTACLE	2	351010	9885
23	THERMOMETER	1	500010	V201462102
24	CONDENSATE EVAP.	1	237900	T12-5000
25	LIFT OFF REF. DR. HINGE	4	152510	1267
26	REF. DOOR LATCH	2	151900	538-C
27	WIRE SHELVES	1	N/A	N/A
28	REM. LOUVER PANEL	2	N/A	N/A

NOTE: ITEMS 13 OR 13 A ARE DIRECTLY INTERCHANGEABLE EITHER COMPONENT MAY BE SUPPLIED WITH THE PRODUCTION UNIT AND EITHER MAY BE STOCKED FOR PARTS REPLACEMENT.

PARTS LIST
FOR SERVICE STAND WITH REFRIGERATED BASE FOR SHIPBOARD USE
(CONTINUED)

ITEM NO.	PART NAME	QUANTITY	STOCK NO.	MFG. PART NO.
29A	INSULATED DOOR		N/A	20" X 22-1/4"
29B	INSULATED DOOR		N/A	19-1/2" X 24-1/2"
29C	INSULATED DOOR		N/A	18-1/2" X 18-1/2"
30A	MAGNETIC GASKET		493320	17-1/2" X 19-3/4
30B	MAGNETIC GASKET		493310	22" X 17"
30C	MAGNETIC GASKET		493440	16" X 16"
31	LEG	4	N/A	A46-9963-1"
32	TRAY RAIL	1	N/A	LOW TEMP
33	TRAY RAIL BRACKET	4	N/A	J19-4960
34	DR. HING STOR. BASE	2	155210	M75-1002
35	NON INSULATED DOOR	1	N/A	14" X 23" OR 26" X 23"
36	DOOR LATCH	1	150330	P90-2000
37	NOT USED			
38	CHROME-PLATED HASP	1	150310	1M80-2500
39	ANTI-SPLASH GRATE	1	310500	J80-5107-6
40	ELECTRICAL RECEPT.	OPT.	340110	CR 5362

PARTS LIST
FOR SERVICE STAND WITH REFRIGERATED BASE FOR SHIPBOARD USE

ITEM NO.	PART NAME	QUANTITY	STOCK NO.	MFG. PART NO.
1	CONDENSING UNIT	1	311935	M2FH-0040-IAA-212
2	START CAPACITOR	1	N/A	014-0038-04
3	RELAY	1	N/A	040-C411-83
4	OVERLOAD PROTECTOR	1	N/A	071-0554-25
5	COMPRESSOR	1	N/A	ARE41C3E-IAA
6	CONDENSER FAN MOTOR	1	N/A	083-0142-00
7	CONDENSER FAN BLADE	1	N/A	050-0259-00
8				
9	CORD SET	1	251210	14/3 SJTO
10	DRIER	1	282300	C-052-T-HH
11	LIQUID LEVEL	1	282400	SA-12S
12	EXPANSION VALVE	1	282576	SQ-0 (1/6T) JC-5'
13	UNIT COOLER	1	312220	TA-10
14	FAN BLADE	1	N/A	5101B
15	FAN MOTOR	1	N/A	25300701
16	DUAL PRESS. CONTROL	1	280610	012-4834-000
17	4" JUNCTION BOX	1	356300	52151-1/2
18	BLANK COVER	1	356100	52-C-1
19	TOGGLE SWITCH	1	335920	90-0001
20	LIGHT ACTUATOR	1	336100	PS-6132
20A	SENSOR, MAGNETIC	1	336100	PS-6001
20B	RELAY	1	515851	RH1B-U
20C	RELAY BASE	1	515840	SH1B-05
21	LIGHT GUARD	2	534100	2778-1010-3000
22	LIGHT RECEPTACLE	2	351010	9885
23	THERMOMETER	1	500010	6812-01
24	CONDENSATE EVAP.	1	237900	T12-5000
25	LIFT OFF REF. DR. HINGE	4	152510	1267
26	REF. DOOR LATCH	2	151900	538-C
27	WIRE SHELVES	1	N/A	N/A
28	REM. LOUVER PANEL	2	N/A	N/A

PARTS LIST
FOR SERVICE STAND WITH REFRIGERATED BASE FOR SHIPBOARD USE

ITEM NO.	PART NAME	QUANTITY	STOCK NO.	MFG. PART NO.
29A	INSULATED DOOR		N/A	20" X 22-1/4"
29B	INSULATED DOOR		N/A	19-1/2" X 24-1/2"
29C	INSULATED DOOR		N/A	18-1/2" X 18-1/2"
30A	MAGNETIC GASKET		493320	17-1/2" X 19-3/4"
30C	MAGNETIC GASKET		493310	22" X 17"
30C	MAGNETIC GASKET		493440	16" X 16"
31	LEG	4	N/A	A47-9932-8"
32	TRAY RAIL	1	N/A	TS-38
33	TRAY RAIL BRACKET	4	N/A	TS-39
34	DR. HING STOR. BASE	2	155210	M75-1002
35	NON INSULATED DOOR	1	N/A	14" X 23" OR 26" X 23"
36	DOOR LATCH	1	150300	64-10-103-50
37	NOT USED			
38	CHROME-PLATED HASP	1	150310	1548A21
39	ANTI-SPLASH GRATE	1	310500	3105
40	ELECTRICAL RECEPT.	OPT.	340110	5362

PARTS LIST

FOR SERVICE STAND WITH REFRIGERATED BASE FOR SHIPBOARD USE

ITEM NO.	PART NAME	QUANTITY	STOCK NO.	MFG. PART NO.
1	CONDENSING UNIT	1	311940	FTAF-0056-IAA-201
2	START CAPACITOR	1	N/A	014-0008-79
3	RELAY	1	N/A	040-0088-04
4	OVERLOAD PROTECTOR	1	N/A	071-0127-06
5	COMPRESSOR	1	N/A	RF18C1E-IAA
6	CONDENSER FAN MOTOR	1	N/A	050-0267-00
7	CONDENSER FAN BLADE	1	N/A	083-0133-00
8				
9	CORD SET		1	25121014/3 SJTO
10	DRIER	1	282300	C-052-T-HH
11	LIQUID LEVEL	1	282400	SA-12S
12	EXPANSION VALVE	1	282576	SQ-0 (1/6T) JC-5'
13	UNIT COOLER	1	312000	KMK-13AF
	OR			
13A	UNIT COOLER	1	312020	MDF-27-13
14	FAN BLADE	2	N/A	5102-C
	OR			
14A	FAN BLADE	2	N/A	105849002
15	FAN MOTOR	2	N/A	25300701
	OR			
15A	FAN MOTOR	2	N/A	102249005
16	DUAL PRESS. CONTROL	1	280610	012-4834-000
17	4" JUNCTION BOX	1	356300	52151-1/2
18	BLANK COVER	1	356100	52-C-1
19	TOGGLE SWITCH	1	335920	90-0001
20	LIGHT ACTUATOR	1	336100	PS-6132
20A	SENSOR, MAGNETIC	1	336100	PS-6001
20B	RELAY	1	515851	RH1B-U
20C	RELAY BASE	1	515840	SH1B-05
21	LIGHT GUARD	2	534100	2778-1010-3000
22	LIGHT RECEPTACLE	2	351010	9885
23	THERMOMETER	1	500010	6812-01
24	CONDENSATE EVAP.	1	237900	T12-5000
25	LIFT OFF REF. DR. HINGE	4	152510	1267
26	REF. DOOR LATCH	2	151900	538-C
27	WIRE SHELVES	1	N/A	N/A
28	REM. LOUVER PANEL	2	N/A	N/A

NOTE: ITEMS 13 OR 13 A ARE DIRECTLY INTERCHANGEABLE EITHER COMPONENT MAY BE SUPPLIED WITH THE PRODUCTION UNIT AND EITHER MAY BE STOCKED FOR PARTS REPLACEMENT.

PARTS LIST

FOR SERVICE STAND WITH REFRIGERATED BASE FOR SHIPBOARD USE

ITEM NO.	PART NAME	QUANTITY	STOCK NO.	MFG. PART NO.
29A	INSULATED DOOR		N/A	20" X 22-1/4
29B	INSULATED DOOR		N/A	19-1/2" X 24-1/2"
29C	INSULATED DOOR		N/A	18-1/2" X 18-1/2"
30A	MAGNETIC GASKET		493320	17-1/2" X 19-3/4
30B	MAGNETIC GASKET		493310	22" X 17"
30C	MAGNETIC GASKET		493440	16" X 16"
31	LEG	4	N/A	A47-9932-8"
32	TRAY RAIL	1	N/A	TS-38
33	TRAY RAIL BRACKET	4	N/A	TS-39
34	DR. HING STOR. BASE	2	155210	M75-1002
35	NON INSULATED DOOR	1	N/A	14" X 23" OR 26" X 23"
36	DOOR LATCH	1	150300	64-10-103-50
37	NOT USED			
38	CHROME-PLATED HASP	1	150310	1548A21
39	ANTI-SPLASH GRATE	1	310500	3105
40	ELECTRICAL RECEPT.	OPT.	340110	5362

NAMES AND ADDRESSES OF SUPPLIERS

ITEMS 27,28,29A,29B, 29C,32,35	LOW TEMP MANUFACTURING COMPANY DIVISION OF LOW TEMP INDUSTRIES, INC. 9192 TARA BOULEVARD JONESBORO, GEORGIA 30236
ITEMS 1,2,3,4,5,6,7	COPELAND CORPORATION 1675 W. CAMPBELL ROAD SIDNEY, OHIO 45365
ITEMS 25,26	KASON SOUTHERN CORPORATION 31-B AMLAJACK BLVD. SHENANDOAH, GEORGIA 30265
ITEMS 10,11,12	THE SPORLAN VALVE COMPANY 206 LANGE DRIVE WASHINGTON, MISSOURI 63090
ITEM 16	RANCO NORTH AMERICA 8115 U.S. ROUTE 42 NORTH PLAIN CITY, OHIO 43064-9671
ITEM 23	MILJOCO CORPORATION 14335 EAST NINE MILE ROAD WARREN, MICHIGAN 48089
ITEM 30A,30B,30C	JEANS' EXTRUSIONS ,INC. STATE ROAD 56 WEST SALEM, INDIANA 47167
ITEM 13,14,15	HEATCRAFT REFRIGERATION PRODUCT LLC 1625 E. VOORHEES DANVILLE, ILLINOIS 61832
ITEMS 13A, 14A, 15A	RUSSELL COIL COMPANY 221 SOUTH BERRY STREET BREA, CALIFORNIA 92621
ITEM 9	AMERICAN CORD SETS INC. 1882 ELMHURST DRIVE ELKGROVE, ILLINOIS 60007

NAMES AND ADDRESSES OF SUPPLIERS
(CONTINUED)

ITEMS 20, 20A	ALEPH 1026 GRISWOLD AVENUE SAN FERNANDO, CALIFORNIA 91340
ITEMS 17, 18	THOMAS & BETTS CORPORATION 8156 T & B BLVD. MEMPHIS, TENNESSEE 38125
ITEMS 20B, 20C	IDEC CORPORATION 1175 ELKO DRIVE SUNNVALE, CALIFORNIA 94089-2209
ITEM 31	NATIONAL METAL INDISTRIES, INC 203 CIRCUIT AVENUE WEST SPRINGFIELD, MASSACHUSETTES 01089
ITEM 40	HUBBELL, INC. 185 PLAINS ROAD MILFORD, CONNECTICUT 06460-2420
ITEMS 21, 24, 33, 34, 36,38,39	COMPONENT HARDWARE 1890 SWARTHMORE AVENUE LAKEWOOD, NEW JERSEY 08701
ITEM 36	SOUTHCO, INC 210 NORTH BRINTON LAKE ROAD CONCORDVILLE, PENNSYLVANIA 19331
ITEM 19	MCGILL ELECTRIC PRODUCTS GROUP 1002 NORTH CAMPBELL STREET VALPARAISO, INDIANA 46385
ITEM 32, 33	UNITED SHOW CASE COMPANY 114 NORTH 27 th STREET MOONACHIE, NEW JERSEY 07074
ITEM 22	LEVITON MANUFACTURING COMPANY INC 59-25 LITTLE NECK PARKWAY LITTLE NECK, NEW YORK 11362-2591

WARRANTY

ALL LOW TEMP FOOD SERVICE EQUIPMENT IS FULLY WARRANTED BY THE MANUFACTURER AGAINST DEFECTS IN MATERIALS OR WORKMANSHIP FOR A PERIOD OF **ONE (1) YEAR FOR PARTS** AND **NINETY DAYS (90) FOR LABOR** FROM THE DATE OF PURCHASE BY THE ORIGINAL PURCHASER AND ONLY TO THE ORIGINAL PURCHASER PROVIDED IT IS INSTALLED AND OPERATED IN ACCORDANCE WITH THE INSTRUCTIONS SUPPLIED WITH THE UNIT. ALSO, IT MUST NOT BE MISUSED, ALTERED OR NEGLECTED AND USED ONLY ON CIRCUITS AND VOLTAGES REQUIRED FOR THAT UNIT.

OUR OBLIGATION UNDER THIS WARRANTY SHALL BE LIMITED TO ONE OF THE FOLLOWING PROCEDURES. SELECTION OF A PROCEDURE SHALL BE AT THE SOLE DISCRETION OF LOW TEMP INDUSTRIES INC.

A. REPLACEMENT OF DEFECTIVE PARTS, SHIPPED F.O.B.FACTORY, IN EXCHANGE FOR THE RETURNED DEFECTIVE PART, SHIPPED PREPAID FREIGHT.

B. FREE REPLACEMENT OF DEFECTIVE PART, SHIPPED F.O.B. FACTORY.

C. DEFECTIVE PART SHIPPED PREPPAID FREIGHT TO FACTORY, REPAIRED AND RETURNED, SHIPPED F.O.B. FACTORY.

D. ALL LABOR COSTS SHALL BE COVERED FOR A PERIOD OF 90 DAYS FROM THE DATE OF PURCHASE.

LOW TEMP INDUSTRIES INC. SHALL NOT BE RESPONSIBLE FOR ANY DAMAGE CAUSED BY FIRE, FLOOD, WINDSTORM, OR ANY OTHER ACT OF GOD; WAR, WHETHER DECLARED OR UNDECLARED NOR SHALL WE BE RESPONSIBLE FOR THE LOSS OF FOOD OR OTHER PRODUCTS DUE TO POWER OR MECHANICAL FAILURE. THIS WARRANTY SHALL NOT COVER ANY DAMAGE CAUSED DURING SHIPMENT, WHICH SHOULD BE REPORTED TO THE DELIVERING CARRIER.

LOW TEMP MANUFACTURING COMPANY
9192 TARA BOULEVARD
JONESBORO, GEORGIA 30236
(770) 478-8803

Ref: NAVSEAINST 4160.3A NAVSEA S0005-AA-GYD-030/TMMP

NAVSEA/SPAWAR TECHNICAL MANUAL DEFICIENCY/EVALUATION REPORT (TMDER)

INSTRUCTIONS: Continue on 8 ½" x 11" page if additional space is needed.
1. Use this report to indicate deficiencies, problems and recommendations relating to publications.
2. For CLASSIFIED TMDERs see OPNAVINST 5510H for mailing requirements.3.
3. For TMDERs that affect more than one publication, submit a separate TMDER for each.
4. Submit TMDERs at web site http://nsdsa.phdnswc.navy.mil or mail to: **COMMANDER, CODE 310 TMDER Bldg 1388, NAVSURFWARCENDIV NSDSA, 4363 MISSILE WAY, PORT HUENEME CA 93043-4307**

1. PUBLICATION NUMBER	2. VOL/PART	3. REV/DATE or CHG/DATE	4. SYSTEM/EQUIPMENT ID

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